

L-band Frequency Analysis for TXIN Orbit Height Change

July 2022

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1. Summary

The original TXIN network was filed with orbital height of 850 km and proposed modification is to change the orbit height to 1175 km. By analyzing the interferences from TXIN850 and TXIN1175 networks, this report provides the evidence that the TXIN1175 network will not generate additional interference to other GSO/NGSO networks. Attachment 1 describes TXIN system parameters before and after the orbital changes. Attachment 2 lists the NGSO networks to be coordinated and their link parameters. Attachment 3 provides the detailed interference analysis for NGSO systems before and after the orbital changes using time simulation method. Attachment 4 provides link parameters for GSO networks needing coordinations. Attachment 5 provides the detailed interference analysis for GSO systems before and after the orbital changes using time simulation method.

2. Introduction

The purpose of this report is to show that upon the orbital change of TXIN NGSO network, there will not be any additional interference being introduced to other GSO/NGSO systems. The original TXIN network has 6 orbits with orbit height of 850 km and inclination of 86°, using frequency range of 1518-1525 MHz in the downlink and 1668-1675 MHz in the uplink. The modified network will have the same number of orbital planes and inclination, using the same frequency ranges, except the orbital height will be raised from 850 km to 1175 km. For simplicity purpose, this original network will be denoted as TXIN850 and the modified network will be denoted as TXIN1175. To ensure that the TXIN1175 will not introduce additional interference in the downlink, TXIN1175 network downlink power spectral density will be reduced by 2dB from TXIN850. The modified network TXIN1175 will have the same terminal density, distribution and uplink e.i.r.p. as TXIN850. To maintain the same coverage of TXIN850, the minimum terminal elevation angle will be raised from 10° to 15°.

Dynamic simulation method is used to assess the interference of the TXIN850 and TXIN1175 to other GSO/NGSO systems. The detailed results are included in this report. By comparing the I/N results from TXIN850 and TXIN1175, the conclusion is that neither uplink nor downlink will introduce additional interference due to the orbital change.

In the frequency range of 1668-1675 MHz, the Radio Regulation 5.380A and 5.379E require that “MSS stations need to protect the meteorological-satellite service and the meteorological aids service from the harmful interferences.” The TXIN operator is committed to conform to the requirements with TXIN1175 network. Since there will not be any change in the uplink, and downlink PSD will be reduced by 2dB, we believe that TXIN1175 will not generate additional interference to these services. This report does not include any detailed analysis in this regard.

For the fixed services and mobile services in the L-band, since there will not be any change in the uplink, with reduced downlink PSD and higher minimum elevation angle, we believe that

TXIN1175 will not generate additional interference to these services. This report does not include any detailed analysis in this regard.

In the frequency range of 1660-1670 MHz, the Radio Regulation 5.149 urges administrations to take all practicable steps to protect the radio astronomy service from harmful interference. The TXIN1175 network will conform to this requirement. This report does not include any detailed analysis in this regard.

3. NGSO Systems Needing Coordinations

The following is a list of NGSO network filings using frequency bands 1668-1675 MHz and 1518-1525 MHz, which are filed between the dates of 2015/11/23 (date received of TXIN850) and 2022/8/9(date received of TXIN1175). These are the networks affected due to the orbital change.

Table 1 List of NGSO System Analyzed

Number	Administration	NGSO System	Protection
1	CHN	ACONNECT	2018/2/6
2	CHN	ACONNECT-B	2019/1/30
3	CHN	ACONNECT-T	2018/2/6
4	CHN	GW-1	2019/4/29
5	CHN	GW-2	2020/9/11
6	CHN	GW-A59	2020/9/11
7	CHN	MCNT-02	2020/7/14
8	CHN	MCNT-03	2020/12/21
9	CHN	SIGNSAT-NGSO	2018/7/18
10	CHN	TXIN-WB	2019/1/13
11	CHN	COMPASS-MEO	2016/2/6
12	CHN	C-SAT-LEO	2019/2/11
13	CHN	DES-LEO	2017/5/19
14	CHN	GEESAT-1	2019/10/28
15	CHN	JK-1	2020/4/17
16	CHN	JUVENILE-OFO	2018/11/12
17	CHN	OKSAT	2018/2/14
18	CHN	QXSI-LOW-ORBITAL-EX-L	2018/6/6
19	CHN	XINGYUN	2016/7/15
20	D	D-ISIPELE-C	2021/1/28
21	E	HISPASAT-LEO-NB	2019/11/14
22	E	SATELIOT_L_S	2020/4/7
23	F	EB-SAT-LEO-1	2017/12/21
24	F	EB-SAT-LEO-1B	2017/12/21
25	F	F-SAT-NG-14	2020/8/25

26	HOL	HOL-MG-A006	2016/12/29
27	LUX	CLEOSAT	2016/2/29
28	SLM	SI-SAT-KURUKURU	2016/12/30
29	CHN	SPACEWAY	2017/12/28
30	CHN	XINGYUN-2	2018/8/13
31	D	D-MEG1-1	2020/5/2
32	UAE	FALAK-1	2018/1/18
33	F	AST-NG-C-4	2017/10/5
34	G	JUKEBOX	2019/5/23
35	CHN	CSN-V1-1	2021/12/20
36	CHN	CSN-V1-2	2021/12/20
37	CHN	CSN-V1-3	2021/12/20
38	CHN	CSN-V2-1	2021/12/20
39	CHN	CSN-V2-2	2021/12/20
40	CHN	CSN-V3-1	2021/12/20
41	CHN	CSN-V3-2	2021/12/20

4. GSO Networks Needing Coordinations

The following is a list of GSO network filings using frequency bands 1668-1675 MHz and 1518-1525 MHz, which are filed between the dates of 2015/11/23 (date received of TXIN850) and 2022/8/9 (date received of TXIN1175). These are the networks affected due to the orbital change. Table 2 lists the GSO networks using meteorological-satellite service and the meteorological aids service. Table 3 lists the GSO networks applied in reverse with TXIN. Table 4 lists the GSO networks using other services.

Table 2 GSO networks using meteorological-satellite service and the meteorological aids service

Number	Administration	NGSO System	Long_nom	Protection
1	CHN	FYGEOSAT-A-79E	79	2017/3/23
2	CHN	FYGEOSAT-A-86.5E	86.5	2017/3/23
3	CHN	FYGEOSAT-A-99.5E	99.5	2017/3/23
4	CHN	FYGEOSAT-A-105E	105	2017/3/23
5	CHN	FYGEOSAT-A-112E	112	2017/3/23
6	CHN	FYGEOSAT-A-123.5E	123.5	2017/3/23
7	PAK	PAKSAT-MM1-56.5E	56.5	2020/5/8
8	USA	GOES-2-60W	-60	2018/8/15
9	USA	GOES-2-104.5W	-104.5	2018/8/15
10	USA	GOES-2-128W	-128	2018/8/15
11	USA	GOES-2-130W	-130	2018/8/15
12	USA	USEWSG-1	61.5	2019/3/25
13	USA	USEWSG-1	61.5	2019/7/17
14	USA	USEWSG-2	63.5	2019/3/25

Table 3 List of GSO networks applied in reverse with TXIN

Number	Administration	NGSO System	Long_nom	Protection
1	USA	USOBO-2B	-96.8	2018/5/10
2	USA	USOBO-3B	-49.4	2018/5/10
3	USA	USOBO-4B	-21.2	2018/5/10

4	USA	USOBO-6B	66	2018/5/10
5	USA	USOBO-7B	73	2018/5/10
6	USA	USOBO-8B	87.5	2018/5/10
7	USA	USOBO-9B	94	2018/5/10
8	USA	USOBO-10B	130.6	2018/5/10
9	USA	USOBO-11B	139	2018/5/10
10	USA	USOBO-12B	51.5	2018/5/10
11	USA	USOBO-13B	-165	2018/5/10
12	USA	USOBO-14B	-145	2018/5/10
13	USA	USOBO-15B	-38	2018/5/10
14	USA	USOBO-16B	8.5	2018/5/10
15	USA	USOBO-17B	103	2018/5/10
16	USA	USOBO-18B	145	2018/5/10
17	USA	USOBO-19B	70	2018/10/10
18	USA	USOBO-6B	66	2018/5/10
19	USA	USOBO-11B	139	2018/5/10

In the L-band (1518-1525 MHz), TXIN is the opposite of the above GSO network. Due to the downlink power spectral density of TXIN1175 is lower than that of TXIN850, we believe that the interference to the above-mentioned GSO network data will be reduced before and after TXIN is raised. Therefore, this paper does not involve the network analysis of TXIN to the GSOs in Table 3.

Table 4 List of NGSO System Analyzed

Number	Administration	NGSO System	Long_nom	Protection
1	ARS	ARABSAT-9L-1E	1	2017/6/26
2	ARS	ARABSAT-9F-44.5E	44.5	2017/6/26
3	ARS	ARABSAT-9M-67.5E	67.5	2017/6/26
4	ARS	ARABSAT-9AS-81.5E	81.5	2017/6/26
5	ARS	ARABSAT-9A-30.5E	30.5	2019/6/9
6	ARS	ARABSAT-9B-26E	26	2019/6/10
7	ARS	ARABSAT-9C-20E	20	2019/6/10
8	ARS	ARABSAT-9E-34.5E	34.5	2019/6/10

9	ARS	ARABSAT-9G-11E	11	2019/6/10
10	ARS	ARABSAT-10Q-58.5E	58.5	2020/10/29
11	ARS	ARABSAT-10P-67.5E	67.5	2020/10/29
12	ARS	ARABSAT-10F-44.5E	44.5	2020/10/29
13	ARS	ARABSAT-10N-14.7E	14.7	2020/10/29
14	ARS	ARABSAT-10G-1E	1	2020/10/29
15	ARS	ARABSAT-10Y-9W	-9	2020/10/29
16	AUS	AUSSAT-H-156E	156	2020/5/27
17	AUS	AUSSAT-H-160E	160	2020/5/27
18	AUS	AUSSAT-H-152E	152	2021/2/17
19	AUS	AUSSAT-H-164E	164	2021/2/17
20	CHN	CHINASAT-E-119.5E	119.5	2017/9/18
21	CHN	CHNNEWSAT-G1-34E	34	2017/11/30
22	CHN	CHNNEWSAT-G1-40E	40	2017/11/30
23	CHN	CHNNEWSAT-G1-44.5E	44.5	2017/11/30
24	CHN	CHNNEWSAT-G1-68E	68	2017/11/30
25	CHN	CHNNEWSAT-G1-73E	73	2017/11/30
26	CHN	CHNNEWSAT-G1-78.2E	78.2	2017/11/30
27	CHN	CHNNEWSAT-G1-101.5E	101.5	2017/11/30
28	CHN	CHNNEWSAT-G1-118E	118	2017/11/30
29	CHN	CHNNEWSAT-G1-148.2E	148.2	2017/11/30
30	CHN	CHNNEWSAT-G1-167E	167	2017/11/30
31	CHN	CHNNEWSAT-G1-169E	169	2017/11/30
32	CHN	CHNNEWSAT-G1-171E	171	2017/11/30
33	CHN	CHNNEWSAT-G1-178W	-178	2017/11/30
34	CHN	CHNNEWSAT-G1-138W	-138	2017/11/30
35	CHN	CHNNEWSAT-G1-132W	-132	2017/11/30
36	CHN	CHNNEWSAT-G1-125W	-125	2017/11/30
37	CHN	CHNNEWSAT-G1-79.5W	-79.5	2017/11/30
38	CHN	CHNNEWSAT-G1-70.5W	-70.5	2017/11/30
39	CHN	CHNNEWSAT-G1-59W	-59	2017/11/30
40	CHN	CHNNEWSAT-G1-48W	-48	2017/11/30
41	CHN	CHNNEWSAT-G1-44.5W	-44.5	2017/11/30
42	CHN	CHNNEWSAT-G1-28W	-28	2017/11/30

43	CHN	CHNNEWSAT-G1-2W	-2	2017/11/30
44	CHN	CHNNEWSAT-G1-160.2E	160.2	2017/11/30
45	CHN	QXSI-25.3E-EX-L	25.3	2018/2/12
46	CHN	QXSI-42.3E-EX-L	42.3	2018/2/12
47	CHN	QXSI-118.3E-EX-L	118.3	2018/2/12
48	CHN	QXSI-148.3E-EX-L	148.3	2018/2/12
49	CHN	QXSI-105.5E-EX-L	105.5	2018/5/4
50	CHN	QXSI-122E-EX-L	122	2018/5/4
51	CHN	QXSI-84.5E-EX-L	84.5	2018/8/13
52	CHN	CHNBSAT-K1-92.2E	92.2	2018/11/26
53	CHN	CHINASAT-F-87.5E	87.5	2019/1/16
54	CHN	CHINASAT-F-110.5E	110.5	2019/1/16
55	CHN	CHINASAT-F-163E	163	2019/1/16
56	CHN	CHINASAT-F-126E	126	2019/2/28
57	CHN	CHINASAT-F-164E	164	2019/8/18
58	CHN	CHNBSAT-K-134E	134	2019/11/20
59	CHN	CHNHTSAT-27.5E	27.5	2019/11/23
60	CHN	CHNHTSAT-164.5E	164.5	2019/11/23
61	CHN	CHNNEWSAT-G2-34E	34	2019/11/23
62	CHN	CHNNEWSAT-G2-73E	73	2019/11/23
63	CHN	CHNNEWSAT-G2-118E	118	2019/11/23
64	CHN	CHNNEWSAT-G2-169E	169	2019/11/23
65	CHN	CHNNEWSAT-G2-138W	-138	2019/11/23
66	CHN	CHNNEWSAT-G2-125W	-125	2019/11/23
67	CHN	CHNNEWSAT-G2-70.5W	-70.5	2019/11/23
68	CHN	CHNHTSAT-111.7W	-111.7	2019/11/23
69	CHN	CHNNEWSAT-G2-44.5W	-44.5	2019/11/23
70	CHN	CHINASAT-G-125E	125	2019/11/23
71	CHN	CHINASAT-G-115.5E	115.5	2019/11/23
72	CHN	CHINASAT-G-87.5E	87.5	2019/11/23
73	CHN	CHNNEWSAT-G2-44.5E	44.5	2019/11/23
74	CHN	CNSAT-76.5W	-76.5	2021/6/29
75	CHN	CNSAT-89.8E	89.8	2021/6/29
76	CHN	CNSAT-152.8E	152.8	2021/6/29

77	CHN	CNSAT-158E	158	2021/6/29
78	CHN	CHINASAT-G-12.4W	-12.4	2021/11/11
79	CHN	CHINASAT-G-72.6W	-72.6	2021/11/11
80	F	MR-SAT-44W	-44	2015/11/28
81	F	RN-SAT-2.9E	2.9	2015/11/28
82	F	LH-SAT-2.4W	-2.4	2015/11/28
83	F	CD-T-SAT-105.2E	105.2	2015/11/28
84	F	CD-SAT-123.1W-G2	-123.1	2016/2/22
85	F	LB-SAT-133E	133	2016/8/25
86	F	CD-SAT-152E-G2	152	2017/5/4
87	F	LH-SAT-151.5E-G2	151.5	2018/1/25
88	F	EG-SAT-117W	-117	2018/11/5
89	F	EG-SAT-38W	-38	2018/11/22
90	F	EG-SAT-22W	-22	2018/11/22
91	F	MT-SAT-41W	-41	2021/3/26
92	F	MT-SAT-72E	72	2021/3/26
93	G	INMARSAT-6-175W	-175	2016/7/13
94	G	INMARSAT-6-147W	-147	2016/7/13
95	G	INMARSAT-6-57W	-57	2016/7/13
96	G	INMARSAT-6-17.5W	-17.5	2016/7/13
97	G	INMARSAT-6-21.5E	21.5	2016/7/13
98	G	INMARSAT-6-58E	58	2016/7/13
99	G	INMARSAT-6-86E	86	2016/7/13
100	G	INMARSAT-6-108.5E	108.5	2016/7/13
101	G	INMARSAT-6-147E	147	2016/7/13
102	G	INMARSAT-6-117E5	117.5	2018/3/7
103	G	INMARSAT-6-28W	-28	2018/3/7
104	G	INMARSAT-6-148W	-148	2018/3/7
105	G	INMARSAT-6-83E5	83.5	2018/3/13
106	G	INMARSAT-6-159W	-159	2018/5/17
107	G	INMARSAT-6-54W-R	-54	2020/9/2
108	G	INMARSAT-6-64E-R	64	2020/9/2
109	G	INMARSAT-6-178E-R	178	2021/2/19
110	HOL	NSS-G6-7	-125	2016/5/27

111	HOL	NSS-G6-10	-72	2016/5/27
112	HOL	NSS-G6-14	-22	2016/5/27
113	HOL	NSS-G7-131W	-131	2017/1/1
114	HOL	NSS-G7 135W	-135	2017/1/1
115	HOL	NSS-G7 137W	-137	2017/1/1
116	HOL	NSS-G7-50.5E	50.5	2017/1/1
117	HOL	NSS-G7 77W	-77	2017/1/1
118	HOL	NSS-G7-83W	-83	2017/1/1
119	HOL	NSS-G8-176E	176	2017/10/10
120	HOL	NSS-G8-95E	95	2017/10/19
121	HOL	NSS-G8-137W	-137	2017/12/12
122	HOL	NSS-G8 139W	-139	2018/10/1
123	HOL	NSS-G8 157W	-157	2018/10/1
124	HOL	NSS-G9-177W	-177	2018/10/31
125	HOL	NSS-G9-57E	57	2018/10/31
126	HOL	NSS-G8-2	-40.5	2019/10/31
127	HOL	NSS-G8-3	-148	2019/12/11
128	HOL	NSS-G10-74W	-74	2020/5/6
129	HOL	NSS-G9-95E	95	2021/6/17
130	IND	INSAT-L-MSS(48E)	48	2018/9/5
131	INS	NUSANTARA-H1-A	116.1	2016/2/24
132	INS	NUSANTARA-A1-A	123	2016/12/28
133	INS	NUSANTARA-BR1-E	150.5	2020/1/7
134	INS	KOMINFO-2	123	2021/12/21
135	INS	KOMINFO-3	113	2022/2/3
136	IRN	IRANSAT-B-70.5E	70.5	2021/10/12
137	IRN	IRANSAT-C-43.5E	43.5	2021/10/12
138	IRN	IRANSAT-C-61.8E	61.8	2021/10/12
139	ISR	AMS-C13-33.5E	33.5	2019/12/17
140	ISR	AMS-C13-72E	72	2019/12/17
141	ISR	AMS-A13-23W	-23	2019/12/17
142	ISR	AMS-A13-45.25W	-45.25	2019/12/19
143	KOR	KOREASAT-128.2E	128.2	2018/3/28
144	KOR	KOREASAT-128.2A	128.2	2021/11/24

145	LUX	LUX-G11-49	-67	2016/5/26
146	LUX	LUX-G7 105W	-105	2017/1/1
147	LUX	LUX-G10-108.2E	108.2	2018/9/7
148	MCO	MONASAT-52EB	52	2017/4/28
149	MCO	MONASAT-52EC	52	2019/10/16
150	MEX	MEXSAT-109.2-L-7M	-109.2	2016/11/30
151	MEX	MEXSAT-113-L-7M	-113	2016/11/9
152	MEX	MEXSAT-116.8-L-7M	-116.8	2016/11/9
153	MLA	MEASAT-1B	91.5	2016/9/30
154	MLA	MEASAT-2C	148	2016/9/30
155	MLA	MEASAT-3B	97	2016/9/30
156	MLA	MEASAT-SA2B	13.4	2016/9/30
157	MLA	MEASAT-SA4C	46	2016/9/30
158	MLA	MEASAT-LA1B	-109.2	2017/1/1
159	MLA	MEASAT-SA3C	-10.5	2017/1/1
160	MLA	MEASAT-1C	91.5	2019/3/7
161	MLA	MEASAT-2D	148	2019/3/7
162	MLA	MEASAT-119.5E-20	119.5	2020/12/31
163	NIG	NIGCOMSAT-2B	-16	2017/12/6
164	NIG	NIGCOMSAT-2D	-9.5	2017/12/6
165	OMA	OMANSAT-46.25E	46.25	2019/12/19
166	OMA	OMANSAT-33.5E	33.5	2020/8/19
167	OMA	OMANSAT-54.5E	54.5	2020/8/19
168	OMA	OMANSAT-72.5E	72.5	2020/8/19
169	OMA	OMANSAT-87.25E	87.25	2020/8/19
170	OMA	OMANSAT-22E	22	2021/2/24
171	OMA	OMANSAT-78E	78	2021/8/26
172	OMA	OMANSAT-72E	72	2021/8/26
173	OMA	OMANSAT-61E	61	2021/8/26
174	PNG	P-SAT-131E	131	2018/12/21
175	ROU	ROU-MILSATCOM1-30.45E	30.45	2020/12/11
176	ROU	ROU-MILSATCOM2-53.5E	53.5	2021/3/23
177	ROU	ROU-MILSATCOM3-26.5E	26.5	2022/3/1
178	S	SMMSAT-11	123	2016/6/9

179	S	SIRIUS-16W-1	-16	2018/10/18
180	THA	THAICOM-51	51	2016/12/23
181	THA	THAISAT-126E	126	2019/12/24
182	THA	THAISAT-120E	120	2020/1/13
183	THA	THAISAT-78.5E	78.5	2021/5/5
184	THA	THAISAT-119.5E	119.5	2021/5/5
185	THA	THAISAT-142E	142	2022/1/19
186	UAE	EMARSAT-12Y-M	-9	2016/1/26
187	UAE	EMARSAT-12D-M	-130.9	2016/1/25
188	UAE	EMARSAT-12F	44	2016/2/7
189	UAE	MADAR-52.5E-2	52.5	2016/3/7
190	UAE	MADAR-60E-2	60	2016/3/7
191	UAE	MADAR-63E	63	2016/3/7
192	UAE	MADAR-47.5E-2	47.5	2016/3/7
193	UAE	MADAR-33E-2	33	2016/6/13
194	UAE	MADAR-20W-2	-20	2016/6/13
195	UAE	EMARSAT-13P	123	2016/9/22
196	UAE	EMARSAT-13V-M	-8	2016/11/23
197	UAE	EMARSAT-13S	98.5	2016/12/18
198	UAE	FUTURA-1	11	2016/12/27
199	UAE	FUTURA-3	14.6	2016/12/27
200	UAE	FUTURA-2	166	2017/1/1
201	UAE	FUTURA-4	44	2017/9/28
202	UAE	MADAR-43W-2	-43	2017/10/1
203	UAE	MADAR-40E	40	2017/10/24
204	UAE	MADAR-2E	2	2017/10/24
205	UAE	MADAR-50W-2	-50	2017/11/6
206	UAE	MADAR-5.5E-2	5.5	2018/7/22
207	UAE	MADAR-46E-2	46	2018/7/22
208	UAE	MADAR-56E	56	2018/7/22
209	UAE	MADAR-72.5E-3	72.5	2018/7/22
210	UAE	MADAR-57W-2	-57	2018/7/22
211	UAE	MADAR-81W-2	-81	2018/7/22
212	UAE	MADAR-95W-2	-95	2018/7/22

213	UAE	MADAR-113W-2	-113	2018/7/22
214	UAE	MADAR-123W-2	-123	2018/7/22
215	UAE	MADAR-1.5W	-1.5	2018/11/24
216	UAE	MADAR-2E-2	2	2018/11/24
217	UAE	MADAR-33.5E-2	33.5	2018/11/24
218	UAE	MADAR-15.5E	15.5	2018/11/24
219	UAE	MADAR-14W	-14	2018/11/24
220	UAE	MADAR-9W	-9	2018/11/24
221	UAE	MADAR-9.5E-2	9.5	2018/11/25
222	UAE	MADAR-14.6E	14.6	2018/11/25
223	UAE	MADAR-98.5E	98.5	2018/12/10
224	UAE	MADAR-33E-3	33	2019/8/22
225	UAE	MADAR-43W-3	-43	2019/8/22
226	UAE	MADAR-44E	44	2019/8/22
227	UAE	MADAR-97E	97	2019/8/22
228	UAE	MADAR-27E-2	27	2019/8/22
229	UAE	MADAR-127E	127	2019/8/22
230	UAE	MADAR-142E-3	142	2019/8/22
231	UAE	MADAR-47.5E-3	47.5	2019/8/22
232	UAE	MADAR-73W-2	-73	2019/8/22
233	UAE	MADAR-93W-2	-93	2019/8/22
234	UAE	MADAR-160E-3	160	2019/8/22
235	UAE	MADAR-67.5E-2	67.5	2019/10/14
236	UAE	MADAR-87E	87	2019/10/14
237	UAE	MADAR-156E	156	2019/10/14
238	UAE	MADAR-174E	174	2019/10/14
239	UAE	MADAR-78.5E	78.5	2019/12/16
240	UAE	MADAR-9E	9	2019/12/16
241	UAE	MADAR-165E	165	2019/12/16
242	UAE	MADAR-152E	152	2019/12/16
243	UAE	MADAR-60E-3	60	2019/12/24
244	UAE	MADAR-106.5E	106.5	2019/12/24
245	UAE	MADAR-123E	123	2020/3/10
246	UAE	MADAR-168E	168	2020/4/22

247	UAE	MADAR-58.5E	58.5	2020/4/22
248	UAE	MADAR-38.5W	-38.5	2020/7/29
249	UAE	MADAR-145W	-145	2020/7/29
250	UAE	MADAR-22.5W	-22.5	2020/7/29
251	UAE	MADAR-98.5E-2	98.5	2020/7/29
252	UAE	MADAR-138E	138	2020/7/29
253	UAE	MADAR-77E	77	2020/8/12
254	UAE	MADAR-57E-3	57	2020/8/12
255	UAE	MADAR-9W-2	-9	2020/8/20
256	UAE	MADAR-121E	121	2020/8/20
257	UAE	MADAR-82W	-82	2020/9/15
258	UAE	MADAR-55E-2	55	2020/10/18
259	UAE	MADAR-148E	148	2020/11/8
260	UAE	MADAR-134E	134	2020/11/8
261	UAE	MADAR-45W-2	-45	2020/11/8
262	UAE	MADAR-15.5E-2	15.5	2020/11/8
263	UAE	MADAR-27.5E	27.5	2020/11/26
264	UAE	MADAR-96E	96	2020/11/26
265	UAE	MADAR-93E	93	2020/11/26
266	UAE	MADAR-112E	112	2020/11/26
267	UAE	MADAR-20W-3	-20	2021/3/16
268	UAE	MADAR-52.5E-3	52.5	2021/5/4
269	UAE	MADAR-131E	131	2021/5/4
270	UAE	MADAR-9E-2	9	2021/6/17
271	UAE	MADAR-47.5E-4	47.5	2021/6/17
272	UAE	MADAR-127E-2	127	2021/6/17
273	UAE	MADAR-72.5E-4	72.5	2021/6/17

5. Methodology Used to Analyze Interference to NGSO Networks

The worst case of interference occurs where interfering transmitter and receiver are located in the same straight line of transmitter and receiver being interfered, where interfered receiving antenna's main beam is receiving the interfering antenna's main beam. Other interference cases are victim receiving antenna's side lobe picks up the interference from the interfering transmitter antenna's main beam or side lobe. In order to capture both of these cases, a dynamic analysis based on time simulation is conducted. Through a sequence of time steps, it first determines the positions of all earth stations, satellites involved for each time instance, setup antenna pointing based on satellite selection strategy, then calculates and records the I/N for each time instance, and eventually obtains the I/N CDF (Cumulative Distribution Function). Separate analysis of TXIN850 and TXIN1175 are performed and I/N CDF results are compared to show that TXIN1175 does not generate more interference than TXIN850.

Due to time constraints, it is not possible to perform calculations for every location on earth. Therefore the approach is to first find the worst geographic locations, then compare the I/N CDF for both TXIN850 and TXIN1175 at these locations. Due to the movement of earth and NGSO satellites, the worst geographic locations are only relevant to latitudes, not longitudes.

The following figure shows TXIN850 network generated epfd CDF at different latitudes of every 5 degrees. Due to the high latitude area, the TXIN850 downlink beam overlap is serious. Without affecting normal communication, the TXIN850 will turn off some beams at latitudes of 60 degrees and above. Therefore the worst geographic location is located at latitude of 55° . Similar calculations on TXIN1175 show that the worst geographic location is at the same latitude as TXIN850.

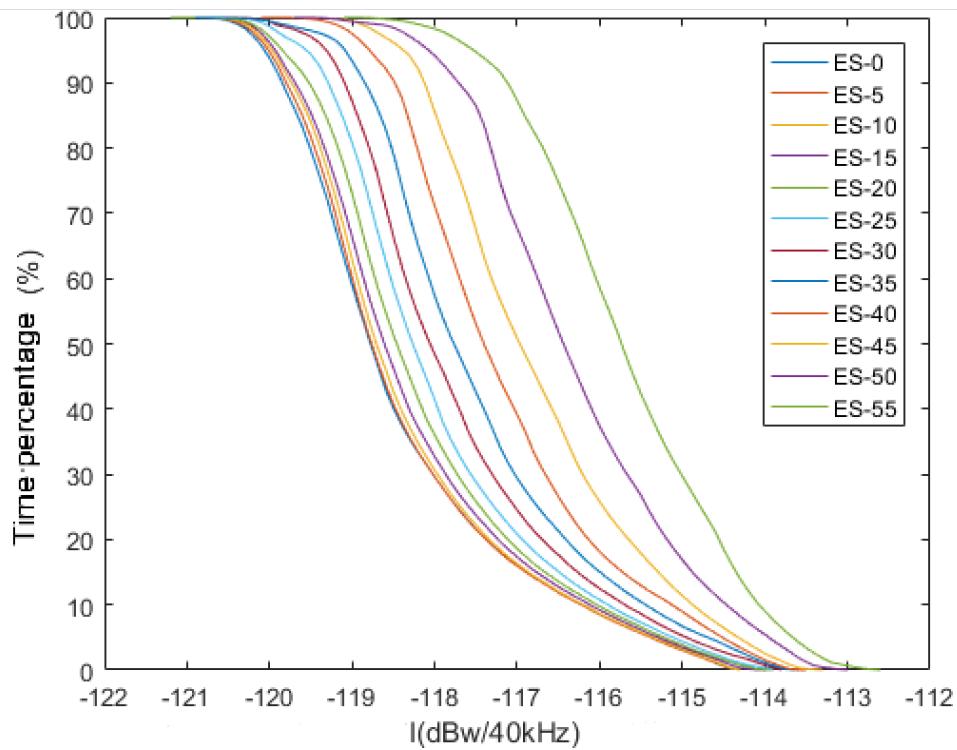


Figure 1 Statistics of Downlink Interference from TXIN Satellite Network (850km) to Earth Stations at Different Latitudes

The subsequent analysis are based on putting co-located interfering and interfered terminals at (55°N, 116°E) to get the worst epfd results. Other locations will have smaller interference than these calculations.

5.1.Downlink Interference

5.1.1.Scenario Description

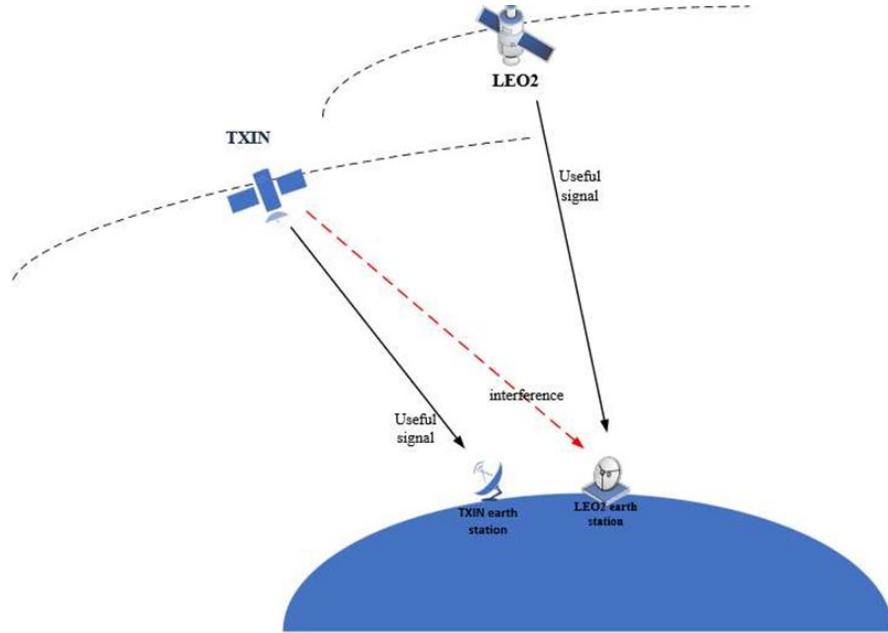


Figure 2 Diagram of Downlink Interference from TXIN (850km) to LEO2

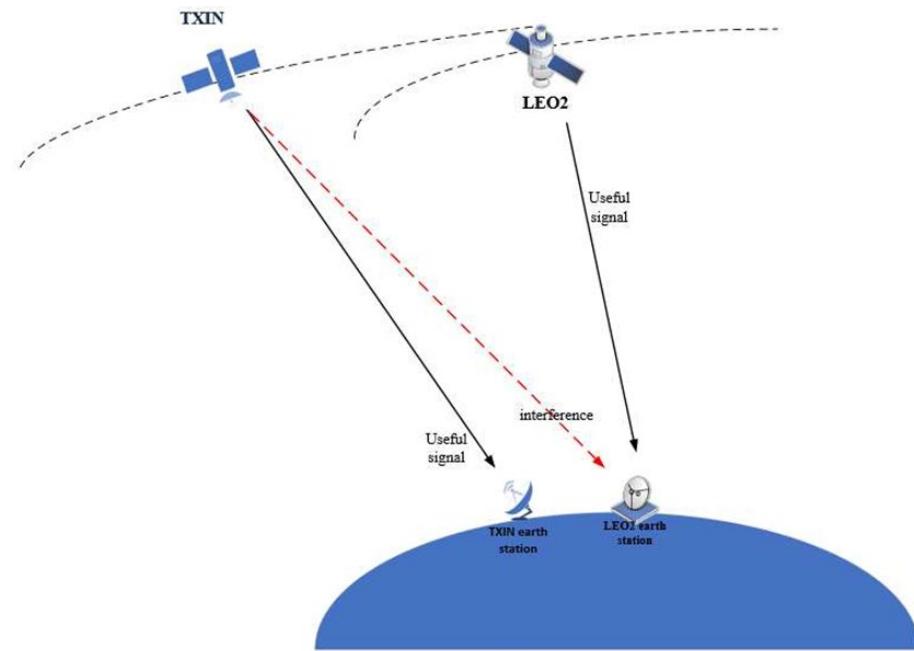


Figure 3 Diagram of Downlink Interference from TXIN (1175km) to LEO2

When TXIN network use same downlink frequencies as LEO2 network's downlink frequencies, the LEO2 network's earth stations could receive unwanted interference from TXIN as shown in above charts.

5.1.2.Downlink Analysis Assumptions

The downlink power spectral density used in this TXIN850 simulation is -56 dBW/Hz for analysis, and the analysis results are also applicable to other beams of TXIN. The following are the assumptions used in the downlink interference analysis to other NGSO networks:

Table 5 Parameters of Downlink Interference Analysis to NGSO

	Victim network	TXIN850	TXIN1175
minimum elevation angle of earth station	10°	10°	15°
satellite selection strategy	highest elevation angle	highest elevation angle	highest elevation angle
max power spectral density(dBW/Hz)		-56	-58
carrier bandwidth(MHz)		5	5
earth station location	55°N, 116°E	55°N, 116°E	55°N, 116°E
constellation repeat period (Days)		5	3
downlink frequency (GHz)	1.5215	1.5215	1.5215

At the beginning of the simulation, one satellite from victim network and one satellite from interfering network is set at straight up direction from the victim earth station. This will guarantee that the I/N CDF captures the worst I/N values.

To achieve more accurate results, the total simulation time period must be significantly longer than the maximum constellation repeat period. We have used 365 days as total simulation time period to perform the analysis.

All analysis are performed under clear sky conditions and assumes no interference mitigations between the NGSO systems.

5.1.3.Downlink Analysis Results

Comparisons of downlink interference caused by TXIN850 and TXIN1175 are provided in Attachment 3.

5.2.Uplink Interference

5.2.1.Scenario Description

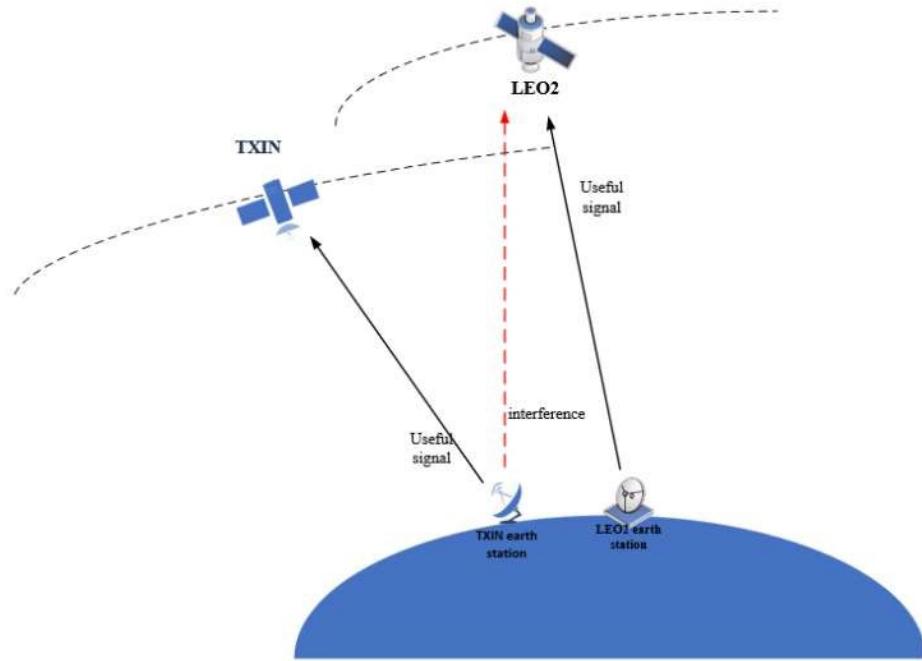


Figure 4 Diagram of Uplink Interference from TXIN (850km) to LEO2

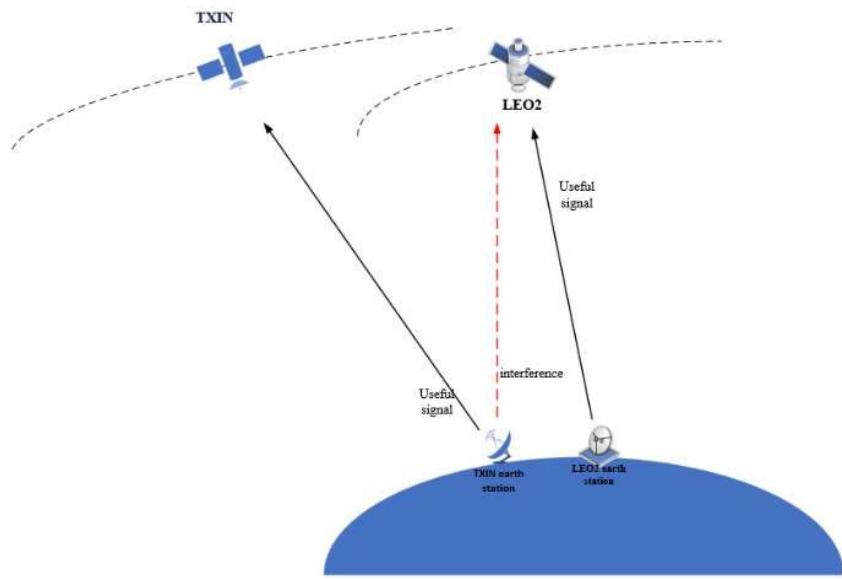


Figure 5 Diagram of Uplink Interference from TXIN (1175km) to LEO2

When TXIN network use same uplink frequencies as LEO2 network's uplink frequencies, the LEO2 network's satellite could receive unwanted interference from earth stations in TXIN network as shown in above charts.

5.2.2.Uplink Analysis Assumptions

The following are the assumptions used in the uplink interference analysis to other NGSO networks:

Table 6 Parameters of Uplink Interference Analysis to NGSO

	Victim network	TXIN850	TXIN1175
minimum elevation angle of earth station	10°	10°	15°
satellite selection strategy	highest elevation angle	highest elevation angle	highest elevation angle
uplink carrier bandwidth(MHz)		0.04	0.04
carrier eirp (dBW)		-1	-1
earth station location	55°N, 116°E	55°N, 116°E	55°N, 116°E
constellation repeat period (Days)		5	3
uplink frequency (GHz)	1.6715	1.6715	1.6715

At the beginning of the simulation, one satellite from interfered network and one satellite from interfering network is set at straight up direction from the victim earth station. This will guarantee that the I/N CDF captures the worst I/N values.

To achieve more accurate results, the total simulation time period must be significantly longer than the maximum constellation repeat period. We have used 365 days as total simulation time period to perform the analysis.

All analysis are performed under clear sky conditions and assumes no interference mitigations between the NGSO systems.

5.2.3.Uplink Analysis Results

Comparisons of uplink interference caused by TXIN850 and TXIN1175 are provided in Attachment 3.

6. Methodology Used to Analyze Interference to GSO Networks

The worst case of interference occurs where interfering transmitter and receiver are located in the same straight line of transmitter and receiver being interfered, when victim receiving antenna's main beam is receiving the interfering antenna's main beam. For GSO links, the worst case occurs when the victim earth station is located on equator and victim GSO satellite has the same longitude as the victim earth station, and an interfering satellite flies in between the victim link. Dynamic analysis based on time simulation is conducted. Through a sequence of time steps, it first determines the positions of all earth stations, satellites involved for each time instance, setup antenna pointing based on satellite selection strategy, then calculates and records the I/N for each time instance, and eventually completes calculations for all time instances to get the I/N CDF (Cumulative Distribution Function). Separate analysis of TXIN850 and TXIN1175 are performed and I/N CDF results are compared to show that TXIN1175 does not generate more interference than TXIN850. In order to capture the worst case, at the beginning of the simulation, the earth stations and satellites are set at the worst case positions.

6.1.Downlink Interference

6.1.1.Scenario Description

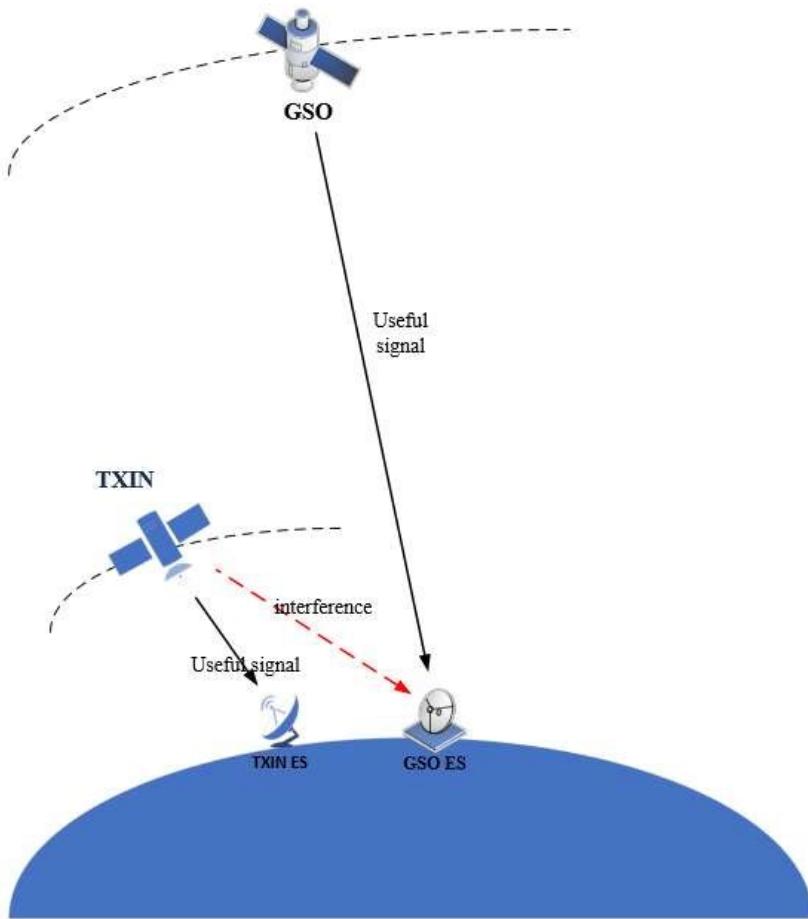


Figure 6 Diagram of Downlink Interference from TXIN to GSO

When TXIN network use same downlink frequencies as GSO network's downlink frequencies, the GSO network's earth stations could receive unwanted interference from TXIN as shown in above chart.

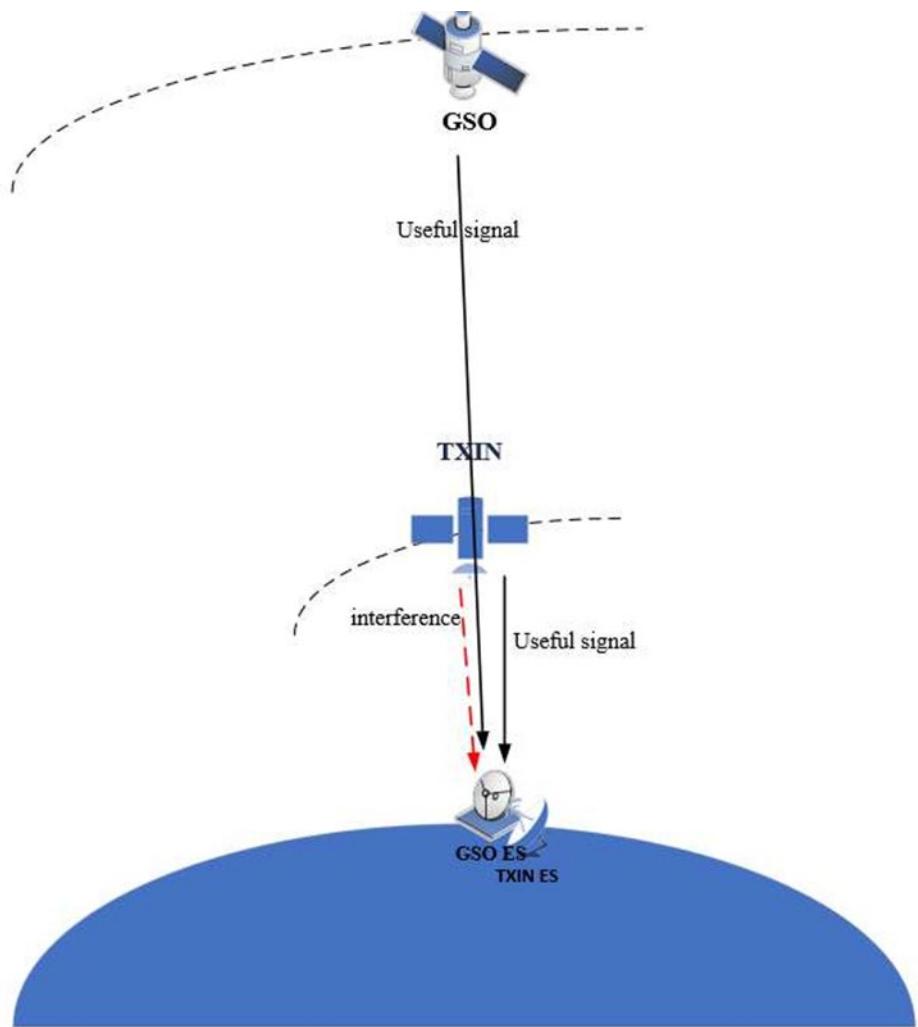


Figure 7 Diagram of Worst-Downlink Interference Scenario from TXIN to GSO

For GSO links, the worst case occurs when the victim earth station is located on equator and victim GSO satellite has the same longitude as the victim earth station, and an interfering satellite flies in between the victim link.

6.1.2. Downlink Analysis Assumptions

The downlink power spectral density used in this TXIN850 simulation is -56 dBW/Hz for analysis, and the analysis results are also applicable to other beams of TXIN. The following are the assumptions used in the downlink interference analysis to the GSO networks:

Table 7 Parameters of Downlink Interference Analysis

	GSO longitude=0°	TXIN850	TXIN1175
minimum elevation angle of earth station	10°	10°	15°
satellite selection strategy	highest elevation angle	highest elevation angle	highest elevation angle
max power spectral density(dBW/Hz)		-56	-58
carrier bandwidth(MHz)		5	5
earth station location	0°N	0°N	0°N
constellation repeat period (Days)		5	3
downlink frequency (GHz)	1.5215	1.5215	1.5215

The victim GSO satellite is set at 0° longitude and victim earth station is located at (0°N, XX°E/W). At the beginning of the simulation, one satellite from TXIN network is set at straight up direction from the victim earth station. This will guarantee that the I/N CDF captures the worst values.

To achieve more accurate results, the total simulation time period must be significantly longer than the maximum constellation repeat period. We have used 365 days as time simulation period to perform the analysis.

All analysis are performed under clear sky conditions and assumes no interference mitigations between the TXIN and GSO systems.

6.1.3.Downlink Analysis Results

Comparisons of downlink interference caused by TXIN850 and TXIN1175 are provided in Attachment 5.

6.2.Uplink Interference to GSO

6.2.1.Scenario Description

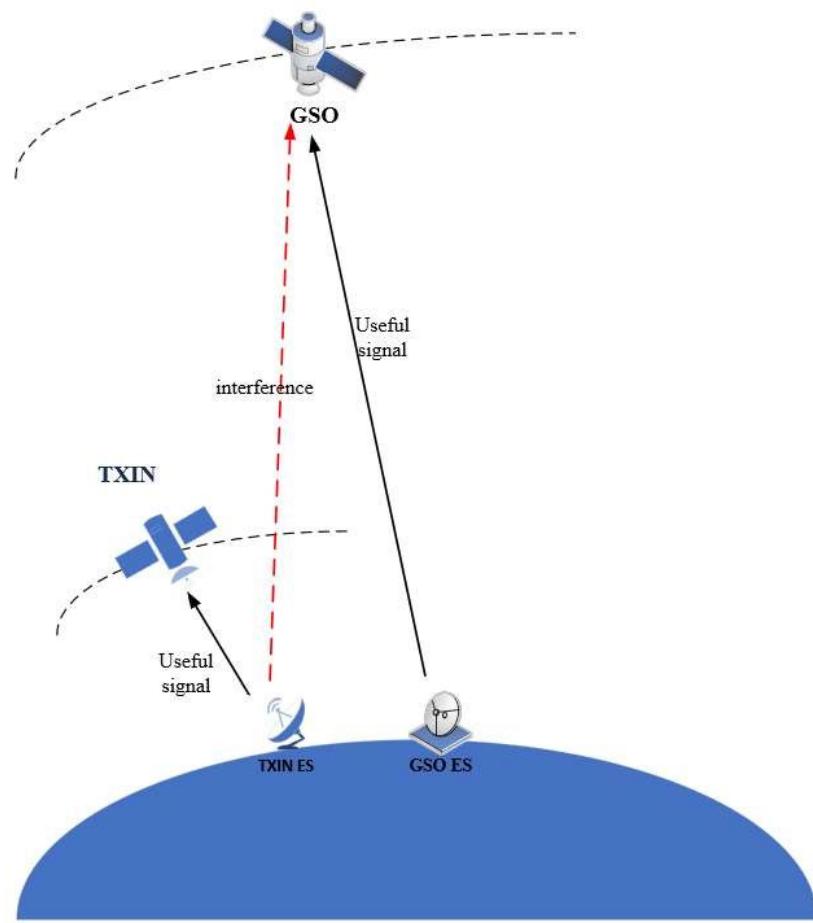


Figure 8 Diagram of Uplink Interference from TXIN to GSO

When TXIN network uses same uplink frequencies as GSO network's uplink frequencies, the GSO network's satellite could receive unwanted interference from earth stations in TXIN network as shown in above charts.

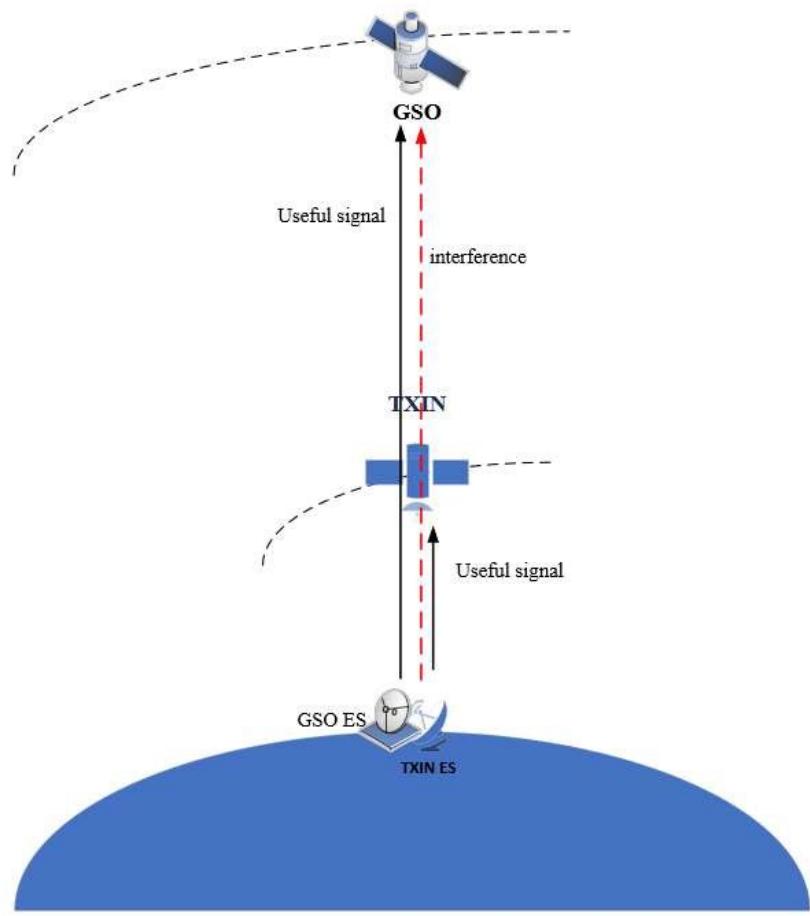


Figure 9 Diagram of Worst-Uplink Interference Scenario from TXIN to GSO

6.2.2.Uplink Analysis Assumptions

The following are the assumptions used in the uplink interference analysis to other GSO networks:

Table 8 Parameters of Uplink Interference Analysis

	GSO longitude = 0°	TXIN850	TXIN1175
minimum elevation angle of earth station	10°	10°	15°
satellite selection strategy	highest elevation angle	highest elevation angle	highest elevation angle

	GSO longitude = 0°	TXIN850	TXIN1175
uplink carrier bandwidth(MHz)		0.04	0.04
carrier eirp (dBW)		-1	-1
earth station location	0°N	0°N	0°N
constellation repeat period (Days)		5	3
uplink frequency (GHz)	1.6715	1.6715	1.6715

The victim GSO satellite is set at 0° longitude and victim earth station is located at (0°N, XX°E/W). At the beginning of the simulation, one satellite from TXIN network is set at straight up direction from the victim earth station. This will guarantee that the I/N CDF captures the worst values.

To achieve more accurate results, the total simulation time period must be significantly longer than the maximum constellation repeat period. We have used 365 days as time simulation period to perform the analysis.

All analysis are performed under clear sky conditions and assumes no interference mitigations between the TXIN and GSO systems.

6.2.3.Uplink Analysis Results

Comparisons of uplink interference to GSO networks caused by TXIN850 and TXIN1175 are provided in Attachment 5.

7. Our Commitment

The responsible administration (China) is committed to ensure that the orbital height change will not generate additional interference to other GSO/NGSO networks. In addition, **for the systems submitted between dates of 2015/11/23 (TXIN850 C/CR submission) and 2022/8/9(submission of TXIN1175 orbital height modification), we will not claim any additional protection from these systems other than the protection given to TXIN850.**

8. Conclusion

The simulation results (Attachment 3 and 5) in this report have shown that the modification of the orbital height will not generate additional interference in either the uplink or downlink for GSO/NGSO networks. With these analysis and the commitment made above, the TXIN operator requests that the ITU to approve this proposed orbital change and that the TXIN to maintain its original protection date of 2015/11/23.

Attachment 1: TXIN System Parameters

1. Constellation Parameters

Table 9 Orbit Parameters of TXIN (850km)

Orbit plane ID	Number of satellites per plane	Right Ascension(°)	Inclination (°)	Orbit height (km)
1	10	0	86	850
2	10	30	86	850
3	10	60	86	850
4	10	90	86	850
5	10	120	86	850
6	10	150	86	850

Table 10 Orbit Parameters of TXIN (1175km)

Orbit plane ID	Number of satellites per plane	Right Ascension(°)	Inclination (°)	Orbit height (km)
1	10	0	86	1175
2	10	30	86	1175
3	10	60	86	1175
4	10	90	86	1175
5	10	120	86	1175
6	10	150	86	1175

2. Link Parameters

2.1. Downlink Parameters

Table 11 Downlink Parameters of TXIN(850km)

beam	freq_min	freq_max	sat.gain	pattern_id	Sat.pattern	Es_gain	es.noise_t	design_emi	pep_max	pwr_ds_max	ant_type.pattern
001	1518	1525	25	275	S1528	0	400	5M00G7W	11	-56	ND-EARTH
001	1518	1525	25	275	S1528	0	400	5M00G7W	11	-56	ND-EARTH
001	1518	1525	25	275	S1528	0	400	5M00G7W	-12	-79	ND-EARTH
001	1518	1525	25	275	S1528	0	400	5M00G7W	-12	-79	ND-EARTH
001	1518	1525	25	275	S1528	0	400	160KD7W	5	-47	ND-EARTH
001	1518	1525	25	275	S1528	0	400	160KD7W	5	-47	ND-EARTH
022	1518	1525	23	275	S1528	0	400	5M00G7W	11	-56	ND-EARTH
022	1518	1525	23	275	S1528	0	400	5M00G7W	11	-56	ND-EARTH
022	1518	1525	23	275	S1528	0	400	160KD7W	5	-47	ND-EARTH
022	1518	1525	23	275	S1528	0	400	160KD7W	5	-47	ND-EARTH
037	1518	1525	20	275	S1528	0	400	5M00G7W	11	-56	ND-EARTH
037	1518	1525	20	275	S1528	0	400	5M00G7W	11	-56	ND-EARTH
037	1518	1525	20	275	S1528	0	400	5M00G7W	-12	-79	ND-EARTH
037	1518	1525	20	275	S1528	0	400	5M00G7W	-12	-79	ND-EARTH
037	1518	1525	20	275	S1528	0	400	160KD7W	5	-47	ND-EARTH
037	1518	1525	20	275	S1528	0	400	160KD7W	5	-47	ND-EARTH
046	1518	1525	22	275	S1528	0	400	5M00G7W	7	-60	ND-EARTH
046	1518	1525	22	275	S1528	0	400	5M00G7W	7	-60	ND-EARTH

046	1518	1525	22	275	S1528	0	400	5M00G7W	-11	-78	ND-EARTH
046	1518	1525	22	275	S1528	0	400	5M00G7W	-11	-78	ND-EARTH
046	1518	1525	22	275	S1528	0	400	160KD7W	1	-51	ND-EARTH
046	1518	1525	22	275	S1528	0	400	160KD7W	1	-51	ND-EARTH
022	1518	1525	23	275	S1528	0	400	5M00G7W	-12	-79	ND-EARTH
022	1518	1525	23	275	S1528	0	400	5M00G7W	-12	-79	ND-EARTH

Table 12 Downlink Parameters of TXIN(1175km)

beam	freq_min	freq_max	sat.gain	pattern_id	Sat.pattern	es.gain	es.noise_t	design_emi	pep_max	pwr_ds_max	ant_type.pattern
001	1518	1525	25	275	S1528	0	400	5M00G7W	9	-58	ND-EARTH
001	1518	1525	25	275	S1528	0	400	5M00G7W	9	-58	ND-EARTH
001	1518	1525	25	275	S1528	0	400	5M00G7W	-14	-81	ND-EARTH
001	1518	1525	25	275	S1528	0	400	5M00G7W	-14	-81	ND-EARTH
001	1518	1525	25	275	S1528	0	400	160KD7W	3	-49	ND-EARTH
001	1518	1525	25	275	S1528	0	400	160KD7W	3	-49	ND-EARTH
022	1518	1525	23	275	S1528	0	400	5M00G7W	9	-58	ND-EARTH
022	1518	1525	23	275	S1528	0	400	5M00G7W	9	-58	ND-EARTH
022	1518	1525	23	275	S1528	0	400	160KD7W	3	-49	ND-EARTH
022	1518	1525	23	275	S1528	0	400	160KD7W	3	-49	ND-EARTH
037	1518	1525	20	275	S1528	0	400	5M00G7W	9	-58	ND-EARTH
037	1518	1525	20	275	S1528	0	400	5M00G7W	9	-58	ND-EARTH
037	1518	1525	20	275	S1528	0	400	5M00G7W	-14	-81	ND-EARTH
037	1518	1525	20	275	S1528	0	400	5M00G7W	-14	-81	ND-EARTH
037	1518	1525	20	275	S1528	0	400	160KD7W	3	-49	ND-EARTH
037	1518	1525	20	275	S1528	0	400	160KD7W	3	-49	ND-EARTH
046	1518	1525	22	275	S1528	0	400	5M00G7W	5	-62	ND-EARTH
046	1518	1525	22	275	S1528	0	400	5M00G7W	5	-62	ND-EARTH
046	1518	1525	22	275	S1528	0	400	5M00G7W	-13	-80	ND-EARTH
046	1518	1525	22	275	S1528	0	400	5M00G7W	-13	-80	ND-EARTH

046	1518	1525	22	275	S1528	0	400	160KD7W	-1	-53	ND-EARTH
046	1518	1525	22	275	S1528	0	400	160KD7W	-1	-53	ND-EARTH
022	1518	1525	23	275	S1528	0	400	5M00G7W	-14	-81	ND-EARTH
022	1518	1525	23	275	S1528	0	400	5M00G7W	-14	-81	ND-EARTH

2.2.Uplink Parameters

Table 13 Uplink Parameters of TXIN(850km)

beam	freq_min	freq_max	sat.gain	noise_t	pattern_id	Sat.patterrn	es.gain	es.noise_t	design_emi	pep_max	pwr_ds_max	ant_type.patter
001	1668	1675	25	600	286	S1528	0		160KG7W	5	-47	ND-EARTH
001	1668	1675	25	600	286	S1528	0		160KG7W	5	-47	ND-EARTH
022	1668	1675	23	600	286	S1528	0		160KG7W	5	-47	ND-EARTH
022	1668	1675	23	600	286	S1528	0		160KG7W	5	-47	ND-EARTH
037	1668	1675	20	600	286	S1528	0		160KG7W	5	-47	ND-EARTH
037	1668	1675	20	600	286	S1528	0		160KG7W	5	-47	ND-EARTH
046	1668	1675	22	600	286	S1528	0		160KG7W	5	-47	ND-EARTH
046	1668	1675	22	600	286	S1528	0		160KG7W	5	-47	ND-EARTH

Table 14 Uplink Parameters of TXIN(1175km)

beam	freq_min	freq_max	sat.gain	noise_t	pattern_id	Sat.patterrn	es.gain	es.noise_t	design_emi	pep_max	pwr_ds_max	ant_type.patter
001	1668	1675	25	600	286	S1528	0		160KG7W	5	-47	ND-EARTH
001	1668	1675	25	600	286	S1528	0		160KG7W	5	-47	ND-EARTH
022	1668	1675	23	600	286	S1528	0		160KG7W	5	-47	ND-EARTH
022	1668	1675	23	600	286	S1528	0		160KG7W	5	-47	ND-EARTH
037	1668	1675	20	600	286	S1528	0		160KG7W	5	-47	ND-EARTH

037	1668	1675	20	600	286	S1528	0		160KG7W	5	-47	ND-EARTH
046	1668	1675	22	600	286	S1528	0		160KG7W	5	-47	ND-EARTH
046	1668	1675	22	600	286	S1528	0		160KG7W	5	-47	ND-EARTH

Attachment 2: Other NGSO network's Parameters

1. Constellation Parameters

The following are the NGSO networks need to be coordinated.

Table 15 Orbit Parameters of ACONNECT

Orbit plane ID	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension(°)	Eccentricity	Argument of perigee(°)
1	9	86.4	1100	0	0	0
2	9	86.4	1100	211.6	0	0
3	9	86.4	1100	63.2	0	0
4	9	86.4	1100	274.8	0	0
5	9	86.4	1100	126.4	0	0
6	9	86.4	1100	338	0	0

Table 16 Orbit Parameters of ACONNECT-B

Orbit plane ID	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension(°)	Eccentricity	Argument of perigee(°)
1	48	86.4	1100	0	0	0
2	48	86.4	1100	10.1	0	0
3	48	86.4	1100	20.2	0	0
4	48	86.4	1100	30.3	0	0
5	48	86.4	1100	40.4	0	0
6	48	86.4	1100	50.5	0	0
7	48	86.4	1100	60.6	0	0
8	48	86.4	1100	70.7	0	0
9	48	86.4	1100	80.8	0	0
10	48	86.4	1100	90.9	0	0

11	48	86.4	1100	101.1	0	0
12	48	86.4	1100	111.2	0	0
13	48	86.4	1100	121.3	0	0
14	48	86.4	1100	131.4	0	0
15	48	86.4	1100	141.5	0	0
16	48	86.4	1100	151.6	0	0
17	48	86.4	1100	161.7	0	0
18	48	86.4	1100	171.8	0	0

Table 17 Orbit Parameters of ACONNECT-T

Orbit plane ID	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension(°)	Eccentricity	Argument of perigee(°)
1	9	86.4	1100	0	0	0
2	9	86.4	1100	211.6	0	0
3	9	86.4	1100	63.2	0	0
4	9	86.4	1100	274.8	0	0
5	9	86.4	1100	126.4	0	0
6	9	86.4	1100	338	0	0

Table 18 Orbit Parameters of GW-1

Orbit plane ID	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension(°)	Eccentricity	Argument of perigee(°)
1	48	86.5	1175	0	0	0
2	48	86.5	1175	10	0	0
3	48	86.5	1175	20	0	0
4	48	86.5	1175	30	0	0
5	48	86.5	1175	40	0	0
6	48	86.5	1175	50	0	0
7	48	86.5	1175	60	0	0
8	48	86.5	1175	70	0	0
9	48	86.5	1175	80	0	0
10	48	86.5	1175	90	0	0

11	48	86.5	1175	100	0	0
12	48	86.5	1175	110	0	0
13	48	86.5	1175	120	0	0
14	48	86.5	1175	187.5	0	0
15	48	86.5	1175	140	0	0
16	48	86.5	1175	150	0	0
17	48	86.5	1175	160	0	0
18	48	86.5	1175	170	0	0
19	48	50	1175	180	0	0

Table 19 Orbit Parameters of GW-2

Number of Orbit planes	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension spacing between adjacent orbits (°)	Eccentricity	Argument of perigee(°)
48	36	30	1145	7.5	0	0
48	36	40	1145	7.5	0	0
48	36	50	1145	7.5	0	0
48	36	60	1145	7.5	0	0

Table 20 Orbit Parameters of GW-A59

Number of Orbit planes	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension spacing between adjacent orbits (°)	Eccentricity	Argument of perigee(°)
16	30	85	590	13.3	0	0
40	50	50	600	9	0	0
60	60	55	508	6	0	0

Table 21 Orbit Parameters of MCNT-02

Orbit plane ID	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension(°)	Eccentricity	Argument of perigee(°)
1	2	86.5	1175	0	0	0

Table 22 Orbit Parameters of MCNT-03

Orbit plane ID	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension(°)	Eccentricity	Argument of perigee(°)
1	12	86.5	1175	0	0	0
2	12	86.5	1175	30.3	0	0
3	12	86.5	1175	60.6	0	0
4	12	86.5	1175	90.9	0	0
5	12	86.5	1175	121.3	0	0
6	12	86.5	1175	151.6	0	0

Table 23 Orbit Parameters of SIGNSAT-NGSO

Number of Orbit planes	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension spacing between adjacent orbits (°)	Eccentricity	Argument of perigee(°)
12	20	86	880	30	0	0

Table 24 Orbit Parameters of TXIN-WB

Number of Orbit planes	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension spacing between adjacent orbits (°)	Eccentricity	Argument of perigee(°)
12	10	86	850	15	0	0

Table 25 Orbit Parameters of COMPASS-MEO

Orbit plane ID	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension(°)	Eccentricity	Argument of perigee(°)
1	10	55	21500	0	0	0
2	10	55	21500	120	0	0
3	10	55	21500	240	0	0

Table 26 Orbit Parameters of DES-LEO

Orbit plane ID	Number of	Inclination	Orbit height (km)	Right Ascension(°)	Eccentricity	Argument of
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	satellites per plane	(°)				perigee(°)
1	10	80	900	0	0	0
2	10	80	900	60	0	0
3	10	80	900	120	0	0
4	10	80	900	180	0	0
5	10	80	900	240	0	0

1

Table 27 Orbit Parameters of GEESAT-1

Orbit plane ID	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension(°)	Eccentricity	Argument of perigee (°)	True anomaly (°)
1	2	50	800	0	0	0	45

Table 28 Orbit Parameters of JK-1

Orbit plane ID	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension(°)	Eccentricity	Argument of perigee (°)	True anomaly (°)
1	1	98	500	0	0	0	0

Table 29 Orbit Parameters of JUVENILE-OFO

Orbit plane ID	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension(°)	Eccentricity	Argument of perigee (°)	True anomaly (°)
1	1	97.4	546	21.5	0	0	0

Table 30 Orbit Parameters of OKSAT

Orbit plane ID	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension(°)	Eccentricity	Argument of perigee (°)
1	8	50	600	23.3	0	0
2	8	50	600	68.3	0	0
3	8	50	600	113.3	0	0
4	8	50	600	158.3	0	0
5	8	50	600	203.3	0	0

6	8	50	600	248.3	0	0
7	8	50	600	293.3	0	0
8	8	50	600	338.3	0	0

Table 31 Orbit Parameters of QXSI-LOW-ORBITAL-EX-L

Orbit plane ID	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension(°)	Eccentricity	Argument of perigee (°)
1	12	80	800	0	0	0
2	12	80	800	45	0	0
3	12	80	800	90	0	0
4	12	80	800	135	0	0
5	12	80	800	180	0	0
6	12	80	800	225	0	0
7	12	80	800	270	0	0
8	12	80	800	315	0	0

Table 32 Orbit Parameters of XINGYUN

Orbit plane ID	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension(°)	Eccentricity	Argument of perigee (°)
1	9	0	1400	0	0	0
2	6	40	800	0	0	0
3	6	40	800	45	0	0
4	6	40	800	89.9	0	0
5	6	40	800	134.8	0	0
6	6	40	800	179.8	0	0
7	6	40	800	224.8	0	0
8	6	40	800	269.9	0	0
9	6	40	800	315	0	0

Table 33 Orbit Parameters of C-SAT-LEO

Number of Orbit	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension spacing between adjacent orbits (°)	Eccentricity	Argument of perigee(°)

planes						
18	48	86.5	1175	10.3	0	0
18	48	86.5	1048	10.3	0	0

Table 34 Orbit Parameters of F-SAT-NG-14

Number of Orbit planes	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension spacing between adjacent orbits (°)	Eccentricity	Argument of perigee(°)
72	46	51	600	15	0	0
72	46	89.5	600	7.5	0	0

Table 35 Orbit Parameters of SPACEWAY

Number of Orbit planes	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension spacing between adjacent orbits (°)	Eccentricity	Argument of perigee(°)
9	8	88	950	20	0	0

Table 36 Orbit Parameters of XINGYUN-2

Number of Orbit planes	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension (°)	Eccentricity	Argument of perigee(°)
1	2	97.5	568	0	0	0

Table 37 Orbit Parameters of D-MEG1-1

Orbit plane ID	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension(°)	Eccentricity	Argument of perigee (°)	True anomaly (°)
1	7	45	6800	0	0	0	0/51.4/102.8/154.2/205.6/257/308.4
2	7	45	6800	90	0	0	0/51.4/102.8/154.2/205.6/257/308.4
3	7	45	6800	180	0	0	0/51.4/102.8/154.2/205.6/257/308.4
4	7	45	6800	270	0	0	0/51.4/102.8/154.2/205.6/257/308.4

Table 38 Orbit Parameters of FALAK-1

Number of Orbit planes	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension spacing between adjacent orbits (°)	Eccentricity	Argument of perigee(°)
2	1	98	600	30	0	0
8	8	98	600	45	0	0
1	8	10	600	/	0	0
1	8	20	600	/	0	0

Table 39 Orbit Parameters of D-ISIPELE-C

Orbit plane ID	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension(°)	Eccentricity	Argument of perigee (°)
1	25	97.7	575	0	0	0
2	25	97.7	575	51.4	0	0
3	25	97.7	575	102.9	0	0
4	25	97.7	575	154.3	0	0
5	25	97.7	575	205.7	0	0
6	25	97.7	575	257.1	0	0
7	25	97.7	575	308.6	0	0

Table 40 Orbit Parameters of HISPASAT-LEO-NB

Number of Orbit planes	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension spacing between adjacent orbits (°)	Eccentricity	Argument of perigee(°)
20	20	97.7	600	9	0	0
20	20	98.6	800	9	0	0
20	8	20	550	9	0	0
20	8	20	750	9	0	0
1	20	0	550	0	0	0
1	20	0	750	0	0	0

Table 41 Orbit Parameters of SATELIOT L S

Number of Orbit planes	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension spacing between adjacent orbits (°)	Eccentricity	Argument of perigee(°)
25	4	97.6	550	14.4	0	0

Table 42 Orbit Parameters of EB-SAT-LEO-1

Number of Orbit planes	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension spacing between adjacent orbits (°)	Eccentricity	Argument of perigee(°)
5	6	97.7	600	72	0	0
5	6	97.7	800	72	0	0
1	6	0	600	0	0	0
4	6	20	600	90	0	0

Table 43 Orbit Parameters of EB-SAT-LEO-1B

Number of Orbit planes	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension spacing between adjacent orbits (°)	Eccentricity	Argument of perigee(°)
3	5	40	450	120	0	0
3	5	50	450	120	0	0
3	5	60	450	120	0	0

Table 44 Orbit Parameters of HOL-MG-A006

Number of Orbit planes	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension spacing between adjacent orbits (°)	Eccentricity	Argument of perigee(°)
10	7	97.8	600	18	0	0
10	7	98.6	800	18	0	0

Table 45 Orbit Parameters of CLEOSAT

Orbit plane ID	Number of satellites per	Inclination (°)	Orbit height (km)	Right Ascension(°)	Eccentricity	Argument of perigee (°)
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	plane					
1	10	86	850	0	0	0
2	10	86	850	30	0	0
3	10	86	850	60	0	0
4	10	86	850	90	0	0
5	10	86	850	120	0	0
6	10	86	850	150	0	0

Table 46 Orbit Parameters of SI-SAT-KURUKURU

Number of Orbit planes	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension spacing between adjacent orbits (°)	Eccentricity	Argument of perigee(°)
20	5	45	587	18	0	0
1	1	52	420	52	0	0
1	1	97.3	505	97.3	0	0
1	1	97.6	525	97.6	0	0
1	1	85	500	85	0	0
10	4	53	582	36	0	0
1	1	97.2	450	97.2	0	0
1	1	97.5	520	97.5	0	0
1	1	97.6	540	97.6	0	0

Table 47 Orbit Parameters of AST-NG-C-4

Number of Orbit planes	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension spacing between adjacent orbits (°)	Eccentricity	Argument of perigee(°)
18	12	88	800	20	0	0
1	36	0	800	0	0	0
18	12	88	800	10	0	0
1	36	0	800	0	0	0
18	12	88	900	20	0	0
1	36	0	900	0	0	0
18	12	88	900	10	0	0

1	36	0	900	0	0	0
18	12	88	1000	20	0	0
1	36	0	1000	0	0	0
18	12	88	1000	10	0	0
1	36	0	1000	0	0	0
18	12	88	1100	20	0	0
1	36	0	1100	0	0	0
18	12	88	1100	10	0	0
1	36	0	1100	0	0	0
18	12	88	1200	20	0	0
1	36	0	1200	0	0	0
18	12	88	1200	10	0	0
1	36	0	1200	0	0	0
18	12	88	1300	20	0	0
1	36	0	1300	0	0	0
18	12	88	1300	10	0	0
1	36	0	1300	0	0	0
18	12	88	1400	20	0	0
1	36	0	1400	0	0	0
18	12	88	1400	10	0	0
1	36	0	1400	0	0	0
18	12	88	1500	20	0	0
1	36	0	1500	0	0	0
18	12	88	1500	10	0	0
1	36	0	1500	0	0	0
6	16	60	800	30	0	0
6	16	62	800	30	0	0
6	16	64	800	30	0	0
6	16	66	800	30	0	0
6	16	68	800	30	0	0
6	16	70	800	30	0	0
6	16	72	800	30	0	0
6	16	74	800	30	0	0
6	16	76	800	30	0	0

6	16	78	800	30	0	0
6	16	80	800	30	0	0
6	16	82	800	30	0	0
6	16	84	800	30	0	0
6	16	86	800	30	0	0
6	16	88	800	30	0	0
6	16	90	800	30	0	0
4	16	98.5	1000	/	0	0
6	16	60	1000	30	0	0
6	16	62	1000	30	0	0
6	16	64	1000	30	0	0
6	16	66	1000	30	0	0
6	16	68	1000	30	0	0
6	16	70	1000	30	0	0
6	16	72	1000	30	0	0
6	16	74	1000	30	0	0
6	16	76	1000	30	0	0
6	16	78	1000	30	0	0
6	16	80	1000	30	0	0
6	16	82	1000	30	0	0
6	16	84	1000	30	0	0
6	16	86	1000	30	0	0
6	16	88	1000	30	0	0
6	16	90	1000	30	0	0
4	16	99.4	1000	/	0	0

Table 48 Orbit Parameters of JUKEBOX

Number of Orbit planes	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension spacing between adjacent orbits (°)	Eccentricity	Argument of perigee(°)
3	4	50	750	60	0	0
6	2	98.4	500	30	0	0

3	4	50	1000	0	0	0
6	2	98.4	800	30	0	0
1	1	97.3	525	/	0	0
5	8	72	1220	72	0	0
5	8	45	1220	72	0	0

Table 49 Orbit Parameters of CSN-V1-1

Number of Orbit planes	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension spacing between adjacent orbits (°)	Eccentricity	Argument of perigee(°)
24	65	30	315	15.4	0	0

Table 50 Orbit Parameters of CSN-V1-2

Number of Orbit planes	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension spacing between adjacent orbits (°)	Eccentricity	Argument of perigee(°)
23	65	30	315	15.4	0	0

Table 51 Orbit Parameters of CSN-V1-3

Number of Orbit planes	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension spacing between adjacent orbits (°)	Eccentricity	Argument of perigee(°)
23	65	30	315	15.4	0	0

Table 52 Orbit Parameters of CSN-V2-1

Number of Orbit planes	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension spacing between adjacent orbits (°)	Eccentricity	Argument of perigee(°)
33	56	40	365	11.1	0	0

Table 53 Orbit Parameters of CSN-V2-2

Number of Orbit planes	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension spacing between adjacent orbits (°)	Eccentricity	Argument of perigee(°)
32	56	40	365	10.1	0	0

Table 54 Orbit Parameters of CSN-V3-1

Number of Orbit planes	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension spacing between adjacent orbits (°)	Eccentricity	Argument of perigee(°)
30	60	50	435	12	0	0

Table 55 Orbit Parameters of CSN-V3-2

Number of Orbit planes	Number of satellites per plane	Inclination (°)	Orbit height (km)	Right Ascension spacing between adjacent orbits (°)	Eccentricity	Argument of perigee(°)
30	60	50	435	12	0	0

2. Link Parameters

2.1. Downlink Parameters

Table 56 Downlink Parameters of C-SAT-LEO

beam_name	freq_m in	freq_m ax	s_beam.g ain	pattern_id	patter n	e_as_stn.g ain	e_as_stn.no i se t	design_e mi	pep_m in	pwr_ds_ min	Es_pattern id	ant_type.patt ern
LD1	1518	1525	32	275	REC-	24	100	2M00G7	-7	-70	607	ND-EARTH

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Table 57 Downlink Parameters of F-SAT-NG-14

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	pattern	e_as_stn.gain	e_as_stn.noise_t	design_emi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.pattern	
L1D	1518	1525	17			0	500	17K5G7W-	-	-11.5	-53.9	608	ND-EARTH

Table 58 Downlink Parameters of SPACEWAY

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	pattern	e_as_stn.gain	e_as_stn.noise_t	design_emi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.pattern
LMDR	1518	1525	10	275	REC-1528	-2	250	1M00G7_W--	2	-58	607	ND-EARTH
LMDR	1518	1525	10	275	REC-1528	0	250	1M00G7_W--	2	-58	607	ND-EARTH
LMDR	1518	1525	10	275	REC-1528	2	250	1M00G7_W--	2	-58	607	ND-EARTH
LMDR	1518	1525	10	275	REC-1528	6	250	1M00G7_W--	2	-58	607	ND-EARTH
LMDR	1518	1525	10	275	REC-1528	12	160	31K3G7_E--	-19.7	-64.7	2	ABCDphi1
LMDR	1518	1525	10	275	REC-1528	7	250	625KG7_W--	0	-58	2	ABCDphi1
LMDR	1518	1525	10	275	REC-1528	16	160	31K3G7_E--	-23.7	-68.7	2	ABCDphi1
LMDR	1518	1525	10	275	REC-1528	13	250	1M50D7_W--	-0.1	-61.9	2	ABCDphi1
LMDR1_3	1518	1525	10	275	REC-1528	-2	250	1M00G7_W--	2	-58	607	ND-EARTH
LMDR1_3	1518	1525	10	275	REC-1528	0	250	1M00G7_W--	2	-58	607	ND-EARTH
LMDR1_3	1518	1525	10	275	REC-1528	2	250	1M00G7_W--	2	-58	607	ND-EARTH
LMDR1	1518	1525	10	275	REC-	6	250	1M00G7	2	-58	607	ND-EARTH

3					1528			W--				
LMDR1 3	1518	1525	10	275	REC- 1528	12	160	31K3G7 E--	-19.7	-64.7	2	ABCDphi1
LMDR1 3	1518	1525	10	275	REC- 1528	7	250	625KG7 W--	0	-58	2	ABCDphi1
LMDR1 3	1518	1525	10	275	REC- 1528	16	160	31K3G7 E--	-23.7	-68.7	2	ABCDphi1
LMDR1 3	1518	1525	10	275	REC- 1528	13	250	1M50D7 W--	-0.1	-61.9	2	ABCDphi1
LMDR2	1518	1525	10	275	REC- 1528	-2	250	1M00G7 W--	-18	-78	607	ND-EARTH
LMDR2	1518	1525	10	275	REC- 1528	0	250	1M00G7 W--	-18	-78	607	ND-EARTH
LMDR2	1518	1525	10	275	REC- 1528	2	250	1M00G7 W--	-18	-78	607	ND-EARTH
LMDR2	1518	1525	10	275	REC- 1528	6	250	1M00G7 W--	-18	-78	607	ND-EARTH
LMDR2	1518	1525	10	275	REC- 1528	12	160	31K3G7 E--	-33	-78	2	ABCDphi1
LMDR2	1518	1525	10	275	REC- 1528	7	250	625KG7 W--	-20	-78	2	ABCDphi1
LMDR2	1518	1525	10	275	REC- 1528	16	160	31K3G7 E--	-33	-78	2	ABCDphi1
LMDR2	1518	1525	10	275	REC- 1528	13	250	1M50D7 W--	-16.2	-78	2	ABCDphi1
LMDR2	1518	1525	10	275	REC- 1528	-2	250	1M00G7 W--	-18	-78	607	ND-EARTH
LMDR2	1518	1525	10	275	REC- 1528	0	250	1M00G7 W--	-18	-78	607	ND-EARTH
LMDR2	1518	1525	10	275	REC- 1528	2	250	1M00G7 W--	-18	-78	607	ND-EARTH
LMDR2	1518	1525	10	275	REC- 1528	6	250	1M00G7 W--	-18	-78	607	ND-EARTH
LMDR2	1518	1525	10	275	REC- 1528	12	160	31K3G7 E--	-33	-78	2	ABCDphi1

LMDR2	1518	1525	10	275	REC-1528	7	250	625KG7 W--	-20	-78	2	ABCDphi1
LMDR2	1518	1525	10	275	REC-1528	16	160	31K3G7 E--	-33	-78	2	ABCDphi1
LMDR2	1518	1525	10	275	REC-1528	13	250	1M50D7 W--	-16.2	-78	2	ABCDphi1
LMDR	1518	1525	10	275	REC-1528	-2	250	1M00G7 W--	2	-58	607	ND-EARTH
LMDR	1518	1525	10	275	REC-1528	0	250	1M00G7 W--	2	-58	607	ND-EARTH
LMDR	1518	1525	10	275	REC-1528	2	250	1M00G7 W--	2	-58	607	ND-EARTH
LMDR	1518	1525	10	275	REC-1528	6	250	1M00G7 W--	2	-58	607	ND-EARTH
LMDR	1518	1525	10	275	REC-1528	12	160	31K3G7 E--	-19.7	-64.7	2	ABCDphi1
LMDR	1518	1525	10	275	REC-1528	7	250	625KG7 W--	0	-58	2	ABCDphi1
LMDR	1518	1525	10	275	REC-1528	16	160	31K3G7 E--	-23.7	-68.7	2	ABCDphi1
LMDR	1518	1525	10	275	REC-1528	13	250	1M50D7 W--	-0.1	-61.9	2	ABCDphi1

Table 59 Downlink Parameters of XINGYUN-2

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	patte rn	e_as_stn.gain	e_as_stn.noise	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.patt ern
LD1	1518	1525	17			0	400	7M00G7 W--	-15.6	-84	607	ND-EARTH
LD1	1518	1525	17			8	130	4M00G7 W--	-15.6	-81.6	605	REC-580-6
LD1	1518	1525	17			12	130	1M30G7 W--	-15.6	-76.7	605	REC-580-6
LD2	1518	1525	20			0	400	7M00G7 W--	-15.6	-84	607	ND-EARTH

LD2	1518	1525	20			8	130	4M00G7 W--	-15.6	-81.6	605	REC-580-6
LD2	1518	1525	20			12	130	1M30G7 W--	-15.6	-76.7	605	REC-580-6
LD3	1518	1525	23			0	400	7M00G7 W--	-15.6	-84	607	ND-EARTH
LD3	1518	1525	23			8	130	4M00G7 W--	-15.6	-81.6	605	REC-580-6
LD3	1518	1525	23			12	130	1M30G7 W--	-15.6	-76.7	605	REC-580-6
LD4	1518	1525	3			0	400	7M00G7 W--	-15.6	-84	607	ND-EARTH
LD4	1518	1525	3			8	130	4M00G7 W--	-15.6	-81.6	605	REC-580-6
LD4	1518	1525	3			12	130	1M30G7 W--	-15.6	-76.7	605	REC-580-6

Table 60 Downlink Parameters of D-MEG1-1

beam_name	freq_min	freq_max	s_beam.gain	pattern_id	pattern	e_as_stn.gain	e_as_stn.noise	design_e_mi	pep_min	pwr_ds_min	Es_pattern_id	ant_type.pattern
LD2	1518	1525	40	634	REC-672-20DB	0	250	5M00G7 W--	-14.9	-81.9	607	ND-EARTH
LD2	1518	1525	40	634	REC-672-20DB	5	250	5M00G7 W--	-19.9	-86.9	607	ND-EARTH
LD2	1518	1525	40	634	REC-672-20DB	11.9	250	5M00G7 W--	-24.8	-91.8	605	REC-580-6
LD2	1518	1525	40	634	REC-672-20DB	0	250	5M00G7 W--	-14.9	-81.9	607	ND-EARTH
LD2	1518	1525	40	634	REC-672-20DB	5	250	5M00G7 W--	-17.9	-84.9	607	ND-EARTH
LD2	1518	1525	40	634	REC-672-20DB	11.9	250	5M00G7 W--	-8.8	-75.8	605	REC-580-6

Table 61 Downlink Parameters of FALAK-1

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	patte rn	e_as_stn.gain	e_as_stn.noise	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.patte rn
LED13	1518	1525	17			0	500	150KG7 W--	-57.2	-109	607	ND-EARTH
LED13	1518	1525	17			12	500	150KG7 W--	-57.2	-109	688	APEUAE229 V01
LED13	1518	1525	17			12	500	150KG7 W--	-57.2	-109	688	APEUAE229 V01
LED14	1518	1525	7			0	500	150KG7 W--	-57.2	-109	607	ND-EARTH
LED14	1518	1525	7			12	500	150KG7 W--	-57.2	-109	688	APEUAE229 V01
LED14	1518	1525	7			12	500	150KG7 W--	-57.2	-109	688	APEUAE229 V01
LED15	1518	1525	10			0	500	150KG7 W--	-57.2	-109	607	ND-EARTH
LED15	1518	1525	10			12	500	150KG7 W--	-57.2	-109	688	APEUAE229 V01
LED15	1518	1525	10			12	500	150KG7 W--	-57.2	-109	688	APEUAE229 V01
LED13	1518	1525	17			12	500	150KG7 W--	-57.2	-109	688	APEUAE229 V01
LED14	1518	1525	7			12	500	150KG7 W--	-57.2	-109	688	APEUAE229 V01
LED15	1518	1525	10			12	500	150KG7 W--	-57.2	-109	688	APEUAE229 V01
LED13	1518	1525	17			12	500	150KG7 W--	-57.2	-109	688	APEUAE229 V01
LED14	1518	1525	7			12	500	150KG7 W--	-57.2	-109	688	APEUAE229 V01
LED15	1518	1525	10			12	500	150KG7 W--	-57.2	-109	688	APEUAE229 V01
LED15	1518	1525	10			12	500	150KG7 W--	-57.2	-109	688	APEUAE229 V01

LED14	1518	1525	7			12	500	150KG7 W--	-57.2	-109	688	APEUAE229 V01
LED13	1518	1525	17			12	500	150KG7 W--	-57.2	-109	688	APEUAE229 V01

Table 62 Downlink Parameters of ACONNECT

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	patte rn	e_as_stn.gain	e_as_stn.noise_t	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.patt ern
LMSSD	1518	1525	28			0	300	1M40G7 W--	5	-56.5	33	AP8

Table 63 Downlink Parameters of ACONNECT-B

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	patte rn	e_as_stn.gain	e_as_stn.noise_t	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.patt ern
LMSSD	1518	1525	28			0	300	1M40G7 W--	5	-56.5	33	AP8

Table 64 Downlink Parameters of ACONNECT-T

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	patte rn	e_as_stn.gain	e_as_stn.noise_t	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.patt ern
LMSSD	1518	1525	28			0	300	1M40G7 W--	5	-56.5	33	AP8

Table 65 Downlink Parameters of GW-1

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	patte rn	e_as_stn.gain	e_as_stn.noise_t	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.patt ern
LU	1668	1675	25	560	286	24		7M00G7 W--	0	-68.4	608	ND-EARTH

Table 66 Downlink Parameters of GW-2

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	patte rn	e_as_stn.gain	e_as_stn.noise_t	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.patt ern
LMD	1518	1525	25		275	0	500	1M00G7	-15	-75	607	ND-EARTH

LMD	1518	1525	25		275	4	500	1M00G7 W--	-15	-75	607	ND-EARTH
LMD1	1518	1525	25		275	0	500	1M00G7 W--	-15	-75	607	ND-EARTH
LMD1	1518	1525	25		275	4	500	1M00G7 W--	-15	-75	607	ND-EARTH
LMD2	1518	1525	25		275	0	500	1M00G7 W--	-15	-75	607	ND-EARTH
LMD2	1518	1525	25		275	4	500	1M00G7 W--	-15	-75	607	ND-EARTH
LMD3	1518	1525	25		275	0	500	1M00G7 W--	-15	-75	607	ND-EARTH
LMD3	1518	1525	25		275	4	500	1M00G7 W--	-15	-75	607	ND-EARTH

Table 67 Downlink Parameters of GW-A59

beam_na me	freq_m in	freq_m ax	s_beam.g ain	pattern_ id	patte rn	e_as_stn.g ain	e_as_stn.no ise t	design_e mi	pep_m in	pwr_ds_ min	Es_pattern id	ant_type.patt ern
LMD	1518	1525	25		275	0	500	1M00G7 W--	-15	-75	607	ND-EARTH
LMD	1518	1525	25		275	4	500	1M00G7 W--	-15	-75	607	ND-EARTH

Table 68 Downlink Parameters of MCNT-02

beam_na me	freq_m in	freq_m ax	s_beam.g ain	pattern_ id	patte rn	e_as_stn.g ain	e_as_stn.no ise t	design_e mi	pep_m in	pwr_ds_ min	Es_pattern id	ant_type.patt ern
LMSSD1	1518	1525	25			0	300	1M40G7 W--	5	-56.5	33	AP8

Table 69 Downlink Parameters of MCNT-03

beam_na me	freq_m in	freq_m ax	s_beam.g ain	pattern_ id	patte rn	e_as_stn.g ain	e_as_stn.no ise t	design_e mi	pep_m in	pwr_ds_ min	Es_pattern id	ant_type.patt ern
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LMSSD1	1518	1525	25			0	300	1M40G7 W--	5	-56.5	33	AP8
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Table 70 Downlink Parameters of SIGNSAT-NGSO

beam_name	freq_m in	freq_m ax	s_beam.g ain	pattern_id	patte rn	e_as_stn.g ain	e_as_stn.no i se t	design_e mi	pep_m in	pwr_ds_ min	Es_pattern id	ant_type.patt ern
LD2	1518	1525	15		275	29.1	900	6M00G7 W--	-13.9	-81.7	607	ND-EARTH
LD2	1518	1525	15		275	21.5	900	512KG7 W--	-17	-74.1	607	ND-EARTH
LD2	1518	1525	15		275	15.5	900	256KG9 W--	-14	-68.1	607	ND-EARTH
LD2	1518	1525	15		275	11.1	900	64K0G9 W--	-20.1	-68.1	607	ND-EARTH

Table 71 Downlink Parameters of TXIN-WB

beam_na me	freq_m in	freq_m ax	s_beam.g ain	pattern_id	patte rn	e_as_stn.g ain	e_as_stn.no i se t	design_e mi	pep_m in	pwr_ds_ min	Es_pattern id	ant_type.patt ern
001	1518	1525	25		275	0	400	5M00G7 W--	0	-67	607	ND-EARTH
001	1518	1525	25		275	0	400	5M00G7 W--	0	-67	607	ND-EARTH
022	1518	1525	23		275	0	400	5M00G7 W--	0	-67	607	ND-EARTH
022	1518	1525	23		275	0	400	5M00G7 W--	0	-67	607	ND-EARTH
022	1518	1525	23		275	0	400	5M00G7 W--	-12	-79	607	ND-EARTH
022	1518	1525	23		275	0	400	5M00G7 W--	-12	-79	607	ND-EARTH
037	1518	1525	20		275	0	400	5M00G7 W--	0	-67	607	ND-EARTH
037	1518	1525	20		275	0	400	5M00G7 W--	0	-67	607	ND-EARTH

037	1518	1525	20		275	0	400	5M00G7 W--	-12	-79	607	ND-EARTH
037	1518	1525	20		275	0	400	5M00G7 W--	-12	-79	607	ND-EARTH
046	1518	1525	22		275	0	400	5M00G7 W--	0	-67	607	ND-EARTH
046	1518	1525	22		275	0	400	5M00G7 W--	0	-67	607	ND-EARTH
046	1518	1525	22		275	0	400	5M00G7 W--	-11	-78	607	ND-EARTH
046	1518	1525	22		275	0	400	5M00G7 W--	-11	-78	607	ND-EARTH
001	1518	1525	25		275	0	400	5M00G7 W--	-12	-79	607	ND-EARTH
001	1518	1525	25		275	0	400	5M00G7 W--	-12	-79	607	ND-EARTH

Table 72 Downlink Parameters of COMPASS-MEO

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	patte rn	e_as_stn.gain	e_as_stn.noise_t	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.patt ern
L2T	1518	1525	26		609	2	440	2M10G7 W--	-2.9	-66.1	607	ND-EARTH

Table 73 Downlink Parameters of DES-LEO

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	patte rn	e_as_stn.gain	e_as_stn.noise_t	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.patt ern
ELD	1518	1525	5		275	0	500	25K0G7 W--	-4	-48	607	ND-EARTH

Table 74 Downlink Parameters of GEESAT-1

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	patte rn	e_as_stn.gain	e_as_stn.noise_t	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.patt ern
LDN	1518	1525	3.5			0	500	7M00G7 W--	7	-61.5	607	ND-EARTH

LDN	1518	1525	3.5			0	500	7M00G7 W--	7	-61.5	607	ND-EARTH
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Table 75 Downlink Parameters of JK-1

beam_name	freq_m in	freq_m ax	s_beam.g ain	pattern_id	patte rn	e_as_stn.g ain	e_as_stn.no i se t	design_e mi	pep_m in	pwr_ds_ min	Es_pattern id	ant_type.patt ern
LMD	1518	1525	4			0	200	7M00G7 W--	0	-68.4	607	ND-EARTH

Table 76 Downlink Parameters of JUVENILE-OFO

beam_name	freq_m in	freq_m ax	s_beam.g ain	pattern_id	patte rn	e_as_stn.g ain	e_as_stn.no i se t	design_e mi	pep_m in	pwr_ds_ min	Es_pattern id	ant_type.patt ern
LD	1518	1525	5		275	0	300	1M00G7 W--	-14.5	-74.5	607	ND-EARTH

Table 77 Downlink Parameters of OKSAT

beam_na me	freq_m in	freq_m ax	s_beam.g ain	pattern_id	patte rn	e_as_stn.g ain	e_as_stn.no i se t	design_e mi	pep_m in	pwr_ds_ min	Es_pattern id	ant_type.patt ern
L1D	1518	1525	15			0	300	200KG7 W--	-10	-62	607	ND-EARTH
L1D	1518	1525	15			0	300	200KG7 W--	-10	-62	607	ND-EARTH

Table 78 Downlink Parameters of QXSI-LOW-ORBITAL-EX-L

beam_na me	freq_m in	freq_m ax	s_beam.g ain	pattern_id	patte rn	e_as_stn.g ain	e_as_stn.no i se t	design_e mi	pep_m in	pwr_ds_ min	Es_pattern id	ant_type.patt ern
LD1	1518	1525	18			0	500	7M00G7 W--	-23	-65	607	ND-EARTH
LD1	1518	1525	18			10	500	7M00G7 W--	-23	-65	607	ND-EARTH
LD2	1518	1525	19			0	500	7M00G7 W--	-23	-65	607	ND-EARTH
LD2	1518	1525	19			10	500	7M00G7	-23	-65	607	ND-EARTH

								W--				
LD3	1518	1525	22			0	500	7M00G7 W--	-23	-65	607	ND-EARTH
LD3	1518	1525	22			10	500	20K0G7 W--	-3	-45	607	ND-EARTH

Table 79 Downlink Parameters of XINGYUN

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	patte rn	e_as_stn.gain	e_as_stn.noise_t	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.patt ern
L1D	1518	1525	18.4			0	400	1M30G7 W--	-15.6	-76.7	607	ND-EARTH
L2D	1518	1525	19.5			0	400	1M30G7 W--	-15.6	-76.7	607	ND-EARTH
L3D	1518	1525	22.8			0	400	1M30G7 W--	-15.6	-76.7	607	ND-EARTH

Table 80 Downlink Parameters of D-ISIPELE-C

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	patte rn	e_as_stn.gain	e_as_stn.noise_t	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.patt ern
LB	1518	1525	12.1			2	290	5M00G7 W--	-10	-77	607	ND-EARTH
LB	1518	1525	12.1			6	290	850KG7 W--	-29.7	-89	607	ND-EARTH

Table 81 Downlink Parameters of HISPASAT-LEO-NB

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	patte rn	e_as_stn.gain	e_as_stn.noise_t	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.patt ern
DL1	1518	1525	3	609		3	300	1K60G1 D--	-56	-88	607	ND-EARTH
DL1	1518	1525	3	609		30	200	50K0G1 D--	-41	-88	607	ND-EARTH

Table 82 Downlink Parameters of SATELIOT L S

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	patte rn	e_as_stn.gain	e_as_stn.noise_t	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.patt ern
L1DN1	1518.04	1525	4.7	609		5.3	1580	60K0F1 D--	3	-40.1	607	ND-EARTH
L1DN1	1518.04	1525	4.7	609		5.3	1580	60K0F1 D--	3	-40.1	607	ND-EARTH
L1DN1	1518.04	1525	4.7	609		5.3	1580	60K0F1 D--	3	-40.1	607	ND-EARTH

Table 83 Downlink Parameters of EB-SAT-LEO-1

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	patte rn	e_as_stn.gain	e_as_stn.noise_t	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.patt ern
DL1	1518	1525	3			3	300	1K60G1 D--	-9.7	-41.8	607	ND-EARTH

Table 84 Downlink Parameters of EB-SAT-LEO-1B

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	patte rn	e_as_stn.gain	e_as_stn.noise_t	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.patt ern
DL1	1518	1525	3			3	300	1K60G1 D--	-9.7	-41.8	607	ND-EARTH

Table 85 Downlink Parameters of CLEOSAT

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	patte rn	e_as_stn.gain	e_as_stn.noise_t	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.patt ern
001	1518	1525	25	275		0	400	120KG7 W--	0	-50.8	607	ND-EARTH
001	1518	1525	25	275		0	400	120KG7 W--	0	-50.8	607	ND-EARTH
001	1518	1525	25	275		0	400	120KG7 W--	-12	-62.8	607	ND-EARTH
001	1518	1525	25	275		0	400	120KG7 W--	-12	-62.8	607	ND-EARTH
022	1518	1525	23	275		0	400	120KG7	0	-50.8	607	ND-EARTH

								W--				
022	1518	1525	23	275		0	400	120KG7 W--	0	-50.8	607	ND-EARTH
022	1518	1525	23	275		0	400	120KG7 W--	-12	-62.8	607	ND-EARTH
022	1518	1525	23	275		0	400	120KG7 W--	-12	-62.8	607	ND-EARTH
037	1518	1525	20	275		0	400	120KG7 W--	0	-50.8	607	ND-EARTH
037	1518	1525	20	275		0	400	120KG7 W--	0	-50.8	607	ND-EARTH
037	1518	1525	20	275		0	400	120KG7 W--	-12	-62.8	607	ND-EARTH
037	1518	1525	20	275		0	400	120KG7 W--	-12	-62.8	607	ND-EARTH
046	1518	1525	22	275		0	400	120KG7 W--	0	-50.8	607	ND-EARTH
046	1518	1525	22	275		0	400	120KG7 W--	0	-50.8	607	ND-EARTH
046	1518	1525	22	275		0	400	120KG7 W--	-11	-61.8	607	ND-EARTH
046	1518	1525	22	275		0	400	120KG7 W--	-11	-61.8	607	ND-EARTH

Table 86 Downlink Parameters of SI-SAT-KURUKURU

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	patte rn	e_as_stn.gain	e_as_stn.noise	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.patt ern
TDL1	1518	1525	4.5	609		30	250	4M20G7 W--	-2.9	-69.1	607	ND-EARTH
UDL1	1518	1525	4.5	609		4.5	400	27K0G7 W--	-2.2	-46.5	607	ND-EARTH
TDL2	1518	1525	5	609		30	250	4M20G7 W--	-2.9	-69.1	607	ND-EARTH
UDL1	1518	1525	4.5	609		0	400	27K0G7	-2.2	-46.5	607	ND-EARTH

UDL1	1518	1525	4.5	609		7.5	400	27K0G7 W--	-2.2	-46.5	607	ND-EARTH
UDL1	1518	1525	4.5	609		10	400	27K0G7 W--	-2.2	-46.5	607	ND-EARTH
UDL2	1518	1525	5	609		4.5	400	27K0G7 W--	-2.2	-46.5	607	ND-EARTH
UDL2	1518	1525	5	609		0	400	27K0G7 W--	-2.2	-46.5	607	ND-EARTH
UDL2	1518	1525	5	609		7.5	400	27K0G7 W--	-2.2	-46.5	607	ND-EARTH
UDL2	1518	1525	5	609		10	400	27K0G7 W--	-2.2	-46.5	607	ND-EARTH
TLD1A	1518	1525	4.5	609		30	250	4M20G7 W--	-17.1	-83.3	607	ND-EARTH
TLD1B	1518	1525	4.5	609		30	250	4M20G7 W--	-1.2	-67.4	607	ND-EARTH
TLD2A	1518	1525	5	609		30	250	4M20G7 W--	-17.6	-83.8	607	ND-EARTH
TLD2B	1518	1525	5	609		30	250	4M20G7 W--	-1.7	-67.9	607	ND-EARTH
UDL1B	1518	1525	4.5	609		4.5	400	66K0G7 W--	-19.2	-67.4	607	ND-EARTH
UDL1B	1518	1525	4.5	609		0	400	66K0G7 W--	-19.2	-67.4	607	ND-EARTH
UDL1B	1518	1525	4.5	609		7.5	400	66K0G7 W--	-19.2	-67.4	607	ND-EARTH

Table 87 Downlink Parameters of AST-NG-C-4

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	patte rn	e_as_stn.g ain	e_as_stn.noise_t	design_e_mi	pep_m_in	pwr_ds_min	c_to_n	ant_type.patt ern
LED14	1518	1525	17			0	500	17K5G7 W--	-10.2	-52.6	7	

LED14	1518	1525	17			4	500	17K5G7 W--	-14.2	-56.6	7	
LED10	1518	1525	17			0	500	17K5G7 W--	-13.1	-55.5	7	
LED10	1518	1525	17			4	500	17K5G7 W--	-17.1	-59.5	7	
LED08	1518	1525	17			0	500	17K5G7 W--	-15	-57.4	7	
LED08	1518	1525	17			4	500	17K5G7 W--	-19	-61.4	7	
LED12	1518	1525	17			0	500	17K5G7 W--	-11.5	-53.9	7	
LED12	1518	1525	17			4	500	17K5G7 W--	-15.5	-57.9	7	

Table 88 Downlink Parameters of JUKEBOX

beam_name	freq_min	freq_max	s_beam.gain	pattern_id	patte rn	e_as_stn.g ain	e_as_stn.noise t	design_e mi	pep_m in	pwr_ds_min	c_to_n	ant_type.patt ern
LDT	1518	1525	5.5	778		4	519	300KG7 W--	1.5	-51.5	7.2	
LDT	1518	1525	5.5	778		15	109	300KG7 W--	0	-53	-9.8	
LDT	1518	1525	5.5	778		4	519	300KG7 W--	1.5	-51.5	7.2	
LDT	1518	1525	5.5	778		15	109	300KG7 W--	0	-53	-9.8	
LDT1	1518	1525	5.5	778		4	519	300KG7 W--	1.5	-51.5	7.2	
LDT1	1518	1525	5.5	778		15	109	300KG7 W--	0	-53	-9.8	
LDT1	1518	1525	5.5	778		4	519	300KG7 W--	1.5	-51.5	7.2	
LDT1	1518	1525	5.5	778		15	109	300KG7 W--	0	-53	-9.8	

LDT2	1518	1525	5.5	778		4	519	300KG7 W--	1.5	-51.5	3.1	
LDT2	1518	1525	5.5	778		15	109	300KG7 W--	0	-53	-13.9	
LDT2	1518	1525	5.5	778		4	519	300KG7 W--	1.5	-51.5	3.1	
LDT2	1518	1525	5.5	778		15	109	300KG7 W--	0	-53	-13.9	
LDT3	1518	1525	5.5	778		4	519	300KG7 W--	1.5	-51.5	1.1	
LDT3	1518	1525	5.5	778		15	109	300KG7 W--	0	-53	-15.8	
LDT3	1518	1525	5.5	778		4	519	300KG7 W--	1.5	-51.5	1.1	
LDT3	1518	1525	5.5	778		15	109	300KG7 W--	0	-53	-15.8	
LDT4	1518	1525	5.5	778		4	519	300KG7 W--	1.5	-51.5	3.6	
LDT4	1518	1525	5.5	778		15	109	300KG7 W--	0	-53	-13.3	
LDT4	1518	1525	5.5	778		4	519	300KG7 W--	1.5	-51.5	3.6	
LDT4	1518	1525	5.5	778		15	109	300KG7 W--	0	-53	-13.3	
LDT6	1518	1525	5.5	778		4	519	300KG7 W--	1.5	-51.5	-0.6	
LDT6	1518	1525	5.5	778		15	109	300KG7 W--	0	-53	-17.5	
LDT6	1518	1525	5.5	778		4	519	300KG7 W--	1.5	-51.5	-0.6	
LDT6	1518	1525	5.5	778		15	109	300KG7 W--	0	-53	-17.5	
LDT5	1518	1525	5.5	778		4	519	300KG7 W--	1.5	-51.5	6.7	
LDT5	1518	1525	5.5	778		15	109	300KG7	0	-53	-10.2	

								W--				
LDT5	1518	1525	5.5	778		4	519	300KG7 W--	1.5	-51.5	6.7	
LDT5	1518	1525	5.5	778		15	109	300KG7 W--	0	-53	-10.2	

Table 89 Downlink Parameters of CSN-V1-1

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	pattern	e_as_stn.gain	e_as_stn.noise	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.pattern
LMD	1518	1525	25	275	REC-1528	0	500	1M00G7 W--	-19	-79	607	ND-EARTH
LMD	1518	1525	25	275	REC-1528	4	500	1M00G7 W--	-19	-79	607	ND-EARTH

Table 90 Downlink Parameters of CSN-V1-2

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	pattern	e_as_stn.gain	e_as_stn.noise	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.pattern
LMD	1518	1525	25	275	REC-1528	0	500	1M00G7 W--	-19	-79	607	ND-EARTH
LMD	1518	1525	25	275	REC-1528	4	500	1M00G7 W--	-19	-79	607	ND-EARTH

Table 91 Downlink Parameters of CSN-V1-3

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	pattern	e_as_stn.gain	e_as_stn.noise	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.pattern
LMD	1518	1525	25	275	REC-1528	0	500	1M00G7 W--	-19	-79	607	ND-EARTH
LMD	1518	1525	25	275	REC-1528	4	500	1M00G7 W--	-19	-79	607	ND-EARTH

Table 92 Downlink Parameters of CSN-V2-1

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	pattern	e_as_stn.gain	e_as_stn.noise_t	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.pattern
LMD	1518	1525	25	275	REC-1528	0	500	1M00G7_W--	-19	-79	607	ND-EARTH
LMD	1518	1525	25	275	REC-1528	4	500	1M00G7_W--	-19	-79	607	ND-EARTH

Table 93 Downlink Parameters of CSN-V2-2

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	pattern	e_as_stn.gain	e_as_stn.noise_t	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.pattern
LMD	1518	1525	25	275	REC-1528	0	500	1M00G7_W--	-19	-79	607	ND-EARTH
LMD	1518	1525	25	275	REC-1528	4	500	1M00G7_W--	-19	-79	607	ND-EARTH

Table 94 Downlink Parameters of CSN-V3-1

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	pattern	e_as_stn.gain	e_as_stn.noise_t	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.pattern
LMD	1518	1525	25	275	REC-1528	0	500	1M00G7_W--	-16	-76	607	ND-EARTH
LMD	1518	1525	25	275	REC-1528	4	500	1M00G7_W--	-16	-76	607	ND-EARTH

Table 95 Downlink Parameters of CSN-V3-2

beam_name	freq_m_in	freq_m_ax	s_beam.gain	pattern_id	pattern	e_as_stn.gain	e_as_stn.noise_t	design_e_mi	pep_m_in	pwr_ds_min	Es_pattern_id	ant_type.pattern
LMD	1518	1525	25	275	REC-1528	0	500	1M00G7_W--	-16	-76	607	ND-EARTH
LMD	1518	1525	25	275	REC-1528	4	500	1M00G7_W--	-16	-76	607	ND-EARTH

2.2.Uplink Parameters

Table 96 Uplink Parameters of C-SAT-LEO

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	Sat pattern	design_e_mi	pwr_ds_max	pwr_ds_min	e_as_stn.gain	Es_pattern_id	es.pattern
LU3	1668	1675	26	600	286	REC-1528	2M00G7 W--	3	-60	24	608	ND-EARTH

Table 97 Uplink Parameters of F-SAT-NG-14

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_e_mi	pwr_ds_mi_n	pwr_ds_mi_n	e_as_stn.gain	Es_pattern_id	es.patter_n
L3U	1668	1675	21.9	290		10K0G7 W--	-20.3	-60.3	0	608	ND-EARTH

Table 98 Uplink Parameters of SPACEWAY

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	Sat_patter_n	design_e_mi	pwr_ds_min	pwr_ds_min	e_as_stn.gain	Es_pattern_id	es.patter_n
LMUR	1668	1675	10	650	286	REC-1528	50K0G7 W--	-10.2	-57.2	-2	608	ND-EARTH
LMUR	1668	1675	10	650	286	REC-1528	50K0G7 W--	-10.2	-57.2	2	608	ND-EARTH
LMUR	1668	1675	10	650	286	REC-1528	512KG7 W--	-0.1	-57.2	6	608	ND-EARTH
LMUR	1668	1675	10	650	286	REC-1528	50K0G7 W--	-10.2	-57.2	0	608	ND-EARTH
LMUR	1668	1675	10	650	286	REC-1528	625KG7 W--	0.8	-57.2	8	51	ABCDph_i1
LMUR	1668	1675	10	650	286	REC-1528	31K3G7E --	-13.3	-58.3	12	51	ABCDph_i1
LMUR	1668	1675	10	650	286	REC-	31K3G7E	-17.6	-62.6	16	51	ABCDph

						1528	--					i1
LMUR	1668	1675	10	650	286	REC-1528	1M50D7 W--	3.5	-58.3	14	51	ABCDph i1

Table 99 Uplink Parameters of XINGYUN-2

beam_name	freq_m_in	freq_m_ax	s_beam.gain	grp.noise_t	pattern_id	Sat—patter_n	design_e_mi	pwr_ds_m_in	pwr_ds_m_in	e_as_stn.gain	Es_pattern_id	es.patte rn
LU1	1668	1675	17	300			4M00G7 W--	-15.6	-81.6	0	608	ND-EARTH
LU1	1668	1675	17	300			1M30G7 W--	-15.6	-76.7	8	606	REC-580-6
LU1	1668	1675	17	300			100KG7 W--	-15.6	-65.6	12	606	REC-580-6
LU3	1668	1675	23	300			7M00G7 W--	-15.6	-84	0	608	ND-EARTH
LU3	1668	1675	23	300			4M00G7 W--	-15.6	-81.6	8	606	REC-580-6
LU3	1668	1675	23	300			1M30G7 W--	-15.6	-76.7	12	606	REC-580-6
LU2	1668	1675	20	300			4M00G7 W--	-15.6	-81.6	0	608	ND-EARTH
LU2	1668	1675	20	300			1M30G7 W--	-15.6	-76.7	8	606	REC-580-6
LU2	1668	1675	20	300			100KG7 W--	-15.6	-65.6	12	606	REC-580-6
LU4	1668	1675	10	300			4M00G7 W--	-15.6	-81.6	0	608	ND-EARTH
LU4	1668	1675	10	300			1M30G7 W--	-15.6	-76.7	8	606	REC-580-6

LU4	1668	1675	10	300			100KG7 W--	-15.6	-65.6	12	606	REC-580-6
LU5	1668	1675	14	300			4M00G7 W--	-15.6	-81.6	0	608	ND-EARTH
LU5	1668	1675	14	300			1M30G7 W--	-15.6	-76.7	8	606	REC-580-6
LU5	1668	1675	14	300			100KG7 W--	-15.6	-65.6	12	606	REC-580-6

Table 100 Uplink Parameters of FALAK-1

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_e_mi	pwr_ds_m_in	pwr_ds_m_in	e_as_stn.gain	Es_pattern_id	es.pattern
LEU10	1668	1675	17	290		150KG7 W--	-57.2	-109	0	608	ND-EARTH
LEU10	1668	1675	17	290		150KG7 W--	-57.2	-109	12	689	APEUAE229V 01
LEU11	1668	1675	10	290		150KG7 W--	-57.2	-109	0	608	ND-EARTH
LEU11	1668	1675	10	290		150KG7 W--	-57.2	-109	12	689	APEUAE229V 01
LEU12	1668	1675	7	290		150KG7 W--	-57.2	-109	0	608	ND-EARTH
LEU12	1668	1675	7	290		150KG7 W--	-57.2	-109	12	689	APEUAE229V 01

Table 101 Uplink Parameters of XINGYUN

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_em_i	pwr_ds_m_in	pwr_ds_m_in	e_as_stn.gain	Es_pattern_id	es.pattern
LEU10	1668	1675	18.4	400		1M30G7 W--	-15.6	-76.7	0	608	ND-EARTH
LEU10	1668	1675	22.8	400		1M30G7 W--	-15.6	-76.7	0	608	ND-EARTH

LEU11	1668	1675	19.5	400		1M30G7 W--	-15.6	-76.7	0	608	ND-EARTH
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Table 102 Uplink Parameters of ACONNECT

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_em_i	pwr_ds_mi_n	pwr_ds_mi_n	e_as_stn.gain	Es_pattern_id	es.patten
LMSSU	1668	1675	28	500		1M00G7 W--	4.8	-55.1	0	76	AP8

Table 103 Uplink Parameters of ACONNECT-B

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_em_i	pwr_ds_mi_n	pwr_ds_mi_n	e_as_stn.gain	Es_pattern_id	es.patter
LMSSU	1668	1675	28	500		1M00G7 W--	4.8	-55.1	0	76	AP8

Table 104 Uplink Parameters of ACONNECT-T

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_em_i	pwr_ds_mi_n	pwr_ds_mi_n	e_as_stn.gain	Es_pattern_id	es.patter
LMSSU	1668	1675	28	500		1M00G7 W--	4.8	-55.1	0	76	AP8

Table 105 Uplink Parameters of GW-1

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_em_i	pwr_ds_mi_n	pwr_ds_mi_n	e_as_stn.gain	Es_pattern_id	es.patter
LU	1668	1675	25	560	286	7M00G7 W--	0	-68.4	24	608	ND-EARTH

Table 106 Uplink Parameters of GW-2

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_em_i	pwr_ds_mi_n	pwr_ds_mi_n	e_as_stn.gain	Es_pattern_id	es.patter
LMU	1668	1675	25	600	286	1M00G7	-15	-75	0	608	ND-

						W--					EARTH
LMU	1668	1675	25	600	286	1M00G7 W--	-15	-75	4	608	ND-EARTH
LMU1	1668	1675	25	600	286	1M00G7 W--	-15	-75	0	608	ND-EARTH
LMU1	1668	1675	25	600	286	1M00G7 W--	-15	-75	4	608	ND-EARTH
LMU2	1668	1675	25	600	286	1M00G7 W--	-15	-75	0	608	ND-EARTH
LMU2	1668	1675	25	600	286	1M00G7 W--	-15	-75	4	608	ND-EARTH
LMU3	1668	1675	25	600	286	1M00G7 W--	-15	-75	0	608	ND-EARTH
LMU3	1668	1675	25	600	286	1M00G7 W--	-15	-75	4	608	ND-EARTH

Table 107 Uplink Parameters of GW-A59

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_em_i	pwr_ds_min	pwr_ds_mn	e_as_stn.gain	Es_pattern_id	es.patten
LMU	1668	1675	25	600	286	1M00G7 W--	-15	-75	0	608	ND-EARTH
LMU	1668	1675	25	600	286	1M00G7 W--	-15	-75	4	608	ND-EARTH

Table 108 Uplink Parameters of MCNT-02

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_em_i	pwr_ds_min	pwr_ds_mn	e_as_stn.gain	Es_pattern_id	es.patter
LMSSU1	1668	1675	25	500		1M00G7 W--	4.8	-55.1	0	76	AP8

Table 109 Uplink Parameters of MCNT-03

beam_na	freq_mi	freq_ma	s_beam.gai	grp.noise	pattern_i	design_em	pwr_ds_mi	pwr_ds_mi	e_as_stn.ga	Es_pattern	es.patter
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me	n	x	n	_t	d	i	n	n	in	id	n
LMSSU1	1668	1675	25	500		1M00G7 W--	4.8	-55.1	0	76	AP8

Table 110 Uplink Parameters of SIGNSAT-NGSO

beam_name	freq_mn	freq_mx	s_beam.gain	grp.noise_t	pattern_id	design_em_i	pwr_ds_mi_n	pwr_ds_mi_n	e_as_stn.gain	Es_pattern_id	es.pattern
LU3	1668	1675	15	600	286	6M00G7 W--	-21.1	-88.9	35.1	608	ND-EARTH
LU3	1668	1675	15	600	286	6M00G7 W--	-15.7	-83.4	29.6	608	ND-EARTH
LU3	1668	1675	15	600	286	512KG7W --	-18.7	-75.8	22	608	ND-EARTH
LU3	1668	1675	15	600	286	256KG9W --	-15.7	-69.8	16	608	ND-EARTH

Table 111 Uplink Parameters of TXIN-WB

beam_name	freq_mn	freq_mx	s_beam.gain	grp.noise_t	pattern_id	design_em_mi	pwr_ds_mi_n	pwr_ds_mi_n	e_as_stn.gain	Es_pattern_id	es.pattern
001	1668	1675	25	600	286	160KG7 W--	0	-52	0	608	ND-EARTH
001	1668	1675	25	600	286	160KG7 W--	0	-52	0	608	ND-EARTH
022	1668	1675	23	600	286	160KG7 W--	0	-52	0	608	ND-EARTH
022	1668	1675	23	600	286	160KG7 W--	0	-52	0	608	ND-EARTH
037	1668	1675	20	600	286	160KG7 W--	0	-52	0	608	ND-EARTH
037	1668	1675	20	600	286	160KG7 W--	0	-52	0	608	ND-EARTH
046	1668	1675	22	600	286	160KG7	0	-52	0	608	ND-

						W--					EARTH
046	1668	1675	22	600	286	160KG7 W--	0	-52	0	608	ND-EARTH

Table 112 Uplink Parameters of COMPASS-MEO

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_em_i	pwr_ds_min	pwr_ds_mil	e_as_stn.gain	Es_pattern_id	es.patten
L3R	1668	1675	16	560	610	6M20G7 W--	5	-62.9	2	608	ND-EARTH
L4R	1668	1675	27	560	610	6M20G7 W--	3	-64.9	2	608	ND-EARTH

Table 113 Uplink Parameters of DES-LEO

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_em_i	pwr_ds_min	pwr_ds_mil	e_as_stn.gain	Es_pattern_id	es.patten
ELU	1668	1675	5	500	286	25K0G7 W--	-6	-50	0	608	ND-EARTH
ELU	1668	1675	5	500	286	25K0G7 W--	-6	-50	10	608	ND-EARTH

Table 114 Uplink Parameters of GEESAT-1

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_em_i	pwr_ds_min	pwr_ds_mil	e_as_stn.gain	Es_pattern_id	es.patten
R	LHUP	1668	1675	12	500	2M00G7 W--	0	-63	0	608	ND-EARTH
R	LLUP	1668	1675	1.5	500	2M00G7 W--	0	-63	0	608	ND-EARTH
R	LHUP	1668	1675	12	500	2M00G7 W--	0	-63	0	608	ND-EARTH
R	LLUP	1668	1675	1.5	500	2M00G7 W--	0	-63	0	608	ND-EARTH

Table 115 Uplink Parameters of JK-1

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_em_i	pwr_ds_mn	pwr_ds_mi	e_as_stn.gain	Es_pattern_id	es.patter_n
LMU	1668	1675	5.2	500		7M00G7_W--	0	-68.5	0	608	ND-EARTH

Table 116 Uplink Parameters of JUVENILE-OFO

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_em_i	pwr_ds_mn	pwr_ds_mi	e_as_stn.gain	Es_pattern_id	es.patter_n
LU	1668	1675	5	610	286	1M00G7_W--	-14.5	-74.5	0	608	ND-EARTH

Table 117 Uplink Parameters of OKSAT

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_em_i	pwr_ds_mn	pwr_ds_mi	e_as_stn.gain	Es_pattern_id	es.patter_n
L1U	1668	1675	15	800		200KG7_W--	-10	-62	0	608	ND-EARTH
L1U	1668	1675	15	800		200KG7_W--	-10	-62	0	608	ND-EARTH

Table 118 Uplink Parameters of QXSI-LOW-ORBITAL-EX-L

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_em_i	pwr_ds_mn	pwr_ds_mi	e_as_stn.gain	Es_pattern_id	es.patter_n
LU1	1668	1675	18	460		7M00G7_W--	-23	-65	10	608	ND-EARTH
LU1	1668	1675	18	460		7M00G7_W--	-23	-65	0	608	ND-EARTH
LU2	1668	1675	19	460		7M00G7_W--	-23	-65	10	608	ND-EARTH
LU2	1668	1675	19	460		7M00G7_W--	-23	-65	0	608	ND-EARTH
LU3	1668	1675	22	460		7M00G7_W--	-23	-65	10	608	ND-EARTH

LU3	1668	1675	22	460		7M00G7 W--	-23	-65	0	608	ND-EARTH
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Table 119 Uplink Parameters of HISPASAT-LEO-NB

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_emi	pwr_ds_mi_n	pwr_ds_mi_n	e_as_stn.gain	Es_pattern_id	es.patten
UL	1668	1675	3	600	610	1K60G1D --	-12.2	-41.8	3	608	ND-EARTH
UL	1668	1675	3	600	610	50K0G1D --	-12.7	-59.7	30	608	ND-EARTH

Table 120 Uplink Parameters of SATELIOT_L_S

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_emi	pwr_ds_mi_n	pwr_ds_mi_n	e_as_stn.gain	Es_pattern_id	es.patter
L1UP1	1670.04	1675	4.5	813	610	60K0F1D --	3	-39.3	5.5	608	ND-EARTH

Table 121 Uplink Parameters of EB-SAT-LEO-1

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_emi	pwr_ds_mi_n	pwr_ds_mi_n	e_as_stn.gain	Es_pattern_id	es.patter
UL	1668	1675	3	600		1K60G1D --	-9.7	-41.8	3	608	ND-EARTH

Table 122 Uplink Parameters of EB-SAT-LEO-1B

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_emi	pwr_ds_mi_n	pwr_ds_mi_n	e_as_stn.gain	Es_pattern_id	es.patter
UL	1668	1675	3	600		1K60G1D --	-9.7	-41.8	3	608	ND-EARTH

Table 123 Uplink Parameters of HOL-MG-A006

beam_name	freq_mi	freq_ma	s_beam.ga	grp.noise	pattern_i	design_emi	pwr_ds_m	pwr_ds_m	e_as_stn.ga	Es_pattern	es.patter
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e	n	x	in	_t	d		in	in	in	id	n
ULLFE	1626.60 5	1675	13	300		120KG1DB N	-5.3	-56	0	608	ND-EARTH
ULLFE	1626.59	1674.99 5	13	300		60K0G1DB N	-5.3	-59	0	608	ND-EARTH
ULLFE	1626.60 5	1675	13	300		120KG1DB N	-5.3	-56	3	608	ND-EARTH
ULLFE	1626.59	1674.99 5	13	300		60K0G1DB N	-5.3	-59	3	608	ND-EARTH
ULLFE	1626.60 5	1675	13	300		120KG1DB N	-5.3	-56	6	608	ND-EARTH
ULLFE	1626.59	1674.99 5	13	300		60K0G1DB N	-5.3	-59	6	608	ND-EARTH
ULLFE	1627.2	1674.99 5	13	300		2M00G1DB N	-5.3	-68.3	0	608	ND-EARTH
ULLFE	1627.2	1674.99 5	13	300		2M00G1DB N	-5.3	-68.3	3	608	ND-EARTH
ULLFE	1627.2	1674.99 5	13	300		2M00G1DB N	-5.3	-68.3	6	608	ND-EARTH
ULLFELOW	1626.60 5	1675	3.1	300		120KG1DB N	-5.3	-56	0	608	ND-EARTH
ULLFELOW	1626.59	1674.99 5	3.1	300		60K0G1DB N	-5.3	-59	0	608	ND-EARTH
ULLFELOW	1626.60 5	1675	3.1	300		120KG1DB N	-5.3	-56	3	608	ND-EARTH
ULLFELOW	1626.59	1674.99 5	3.1	300		60K0G1DB N	-5.3	-59	3	608	ND-EARTH
ULLFELOW	1626.60 5	1675	3.1	300		120KG1DB N	-5.3	-56	6	608	ND-EARTH
ULLFELOW	1626.59	1674.99 5	3.1	300		60K0G1DB N	-5.3	-59	6	608	ND-EARTH
ULLFELOW	1627.21 2	1674.98 3	3.1	300		2M00G1DB N	-5.3	-68.3	0	608	ND-EARTH
ULLFELOW	1627.21 2	1674.98 3	3.1	300		2M00G1DB N	-5.3	-68.3	3	608	ND-EARTH

ULLFELOW	1627.21	1674.98	3.1	300		2M00G1DB N	-5.3	-68.3	6	608	ND-EARTH
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Table 124 Uplink Parameters of CLEOSAT

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_emission	pwr_ds_min	pwr_ds_max	e_as_stn.gain	Es_pattern_id	es.patten
001	1668	1675	25	600	286	120KG7 W--	0	-50.8	0	608	ND-EARTH
001	1668	1675	25	600	286	120KG7 W--	0	-50.8	0	608	ND-EARTH
022	1668	1675	23	600	286	120KG7 W--	0	-50.8	0	608	ND-EARTH
022	1668	1675	23	600	286	120KG7 W--	0	-50.8	0	608	ND-EARTH
037	1668	1675	20	600	286	120KG7 W--	0	-50.8	0	608	ND-EARTH
037	1668	1675	20	600	286	120KG7 W--	0	-50.8	0	608	ND-EARTH
046	1668	1675	22	600	286	120KG7 W--	0	-50.8	0	608	ND-EARTH

Table 125 Uplink Parameters of SI-SAT-KURUKURU

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_emission	pwr_ds_min	pwr_ds_max	e_as_stn.gain	Es_pattern_id	es.patter
TUL2	1668.5	1675	4.5	450	610	262KG7 W--	-17.3	-71.5	30	608	ND-EARTH
UUL1	1668.5	1675	4.5	450	610	380KG7 W--	-6	-53.6	4.5	608	ND-EARTH
TUL1	1668.5	1675	5	450	610	262KG7 W--	-17.3	-71.5	30	608	ND-EARTH
UUL1	1668.5	1675	4.5	450	610	380KG7 W--	-6	-53.6	0	608	ND-EARTH
UUL1	1668.5	1675	4.5	450	610	380KG7	-6	-53.6	7.5	608	ND-

						W--					EARTH
UUL1	1668.5	1675	4.5	450	610	380KG7 W--	-6	-53.6	10	608	ND-EARTH
UUL2	1668.5	1675	5	450	610	380KG7 W--	-6	-53.6	4.5	608	ND-EARTH
UUL2	1668.5	1675	5	450	610	380KG7 W--	-6	-53.6	0	608	ND-EARTH
UUL2	1668.5	1675	5	450	610	380KG7 W--	-6	-53.6	7.5	608	ND-EARTH
UUL2	1668.5	1675	5	450	610	380KG7 W--	-6	-53.6	10	608	ND-EARTH
TUL1B	1668.5	1675	5	450	610	262KG7 W--	-17.3	-71.5	30	608	ND-EARTH
TUL2B	1668.5	1675	4.5	450	610	262KG7 W--	-17.3	-71.5	30	608	ND-EARTH
UUL1B	1668.5	1675	4.5	450	610	380KG7 W--	-6	-53.6	4.5	608	ND-EARTH
UUL1B	1668.5	1675	4.5	450	610	380KG7 W--	-6	-53.6	0	608	ND-EARTH
UUL1B	1668.5	1675	4.5	450	610	380KG7 W--	-6	-53.6	7.5	608	ND-EARTH
UUL1B	1668.5	1675	4.5	450	610	380KG7 W--	-6	-53.6	10	608	ND-EARTH
UUL2B	1668.5	1675	5	450	610	380KG7 W--	-6	-53.6	4.5	608	ND-EARTH
UUL2B	1668.5	1675	5	450	610	380KG7 W--	-6	-53.6	0	608	ND-EARTH
UUL2B	1668.5	1675	5	450	610	380KG7 W--	-6	-53.6	7.5	608	ND-EARTH
UUL2B	1668.5	1675	5	450	610	380KG7 W--	-6	-53.6	10	608	ND-EARTH
TUL1E	1668.5	1675	5	450	610	262KG7 W--	-17.3	-71.5	30	608	ND-EARTH
TUL2E	1668.5	1675	4.5	450	610	262KG7	-17.3	-71.5	30	608	ND-

						W--					EARTH
UUL1E	1668.5	1675	4.5	450	610	380KG7 W--	-6	-53.6	4.5	608	ND-EARTH
UUL1E	1668.5	1675	4.5	450	610	380KG7 W--	-6	-53.6	0	608	ND-EARTH
UUL1E	1668.5	1675	4.5	450	610	380KG7 W--	-6	-53.6	7.5	608	ND-EARTH
UUL1E	1668.5	1675	4.5	450	610	380KG7 W--	-6	-53.6	10	608	ND-EARTH
UUL2E	1668.5	1675	5	450	610	380KG7 W--	-6	-53.6	4.5	608	ND-EARTH
UUL2E	1668.5	1675	5	450	610	380KG7 W--	-6	-53.6	0	608	ND-EARTH
UUL2E	1668.5	1675	5	450	610	380KG7 W--	-6	-53.6	7.5	608	ND-EARTH
UUL2E	1668.5	1675	5	450	610	380KG7 W--	-6	-53.6	10	608	ND-EARTH

Table 126 Uplink Parameters of AST-NG-C-4

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_emi	pwr_ds_min	pwr_ds_mian	e_as_stn.gain	Es_pattern_id	es.patten
LEU14	1668	1675	23.2	290		10K0G7 W--	-20.3	-60.3	0		
LEU14	1668	1675	23.2	290		10K0G7 W--	-24.3	-64.3	4		
LEU10	1668	1675	20.3	290		10K0G7 W--	-20.3	-60.3	0		
LEU10	1668	1675	20.3	290		10K0G7 W--	-24.3	-64.3	4		
LEU08	1668	1675	18.4	290		10K0G7 W--	-20.4	-60.4	0		
LEU08	1668	1675	18.4	290		10K0G7 W--	-24.4	-64.4	4		

LEU12	1668	1675	21.9	290		10K0G7 W--	-20.3	-60.3	0		
LEU12	1668	1675	21.9	290		10K0G7 W--	-24.3	-64.3	4		
LEU14	1668	1675	23.2	290		10K0G7 W--	-20.3	-60.3	0		

Table 127 Uplink Parameters of JUKEBOX

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_emi	pwr_ds_mi_n	pwr_ds_mi_n	e_as_stn.gain	Es_pattern_id	es.pattern
LUT	1668	1675	5.5	411	779	300KG7 W--	-17	-70	5		
LUT	1668	1675	5.5	411	779	300KG7 W--	-27	-80	15		
LUT	1668	1675	5.5	411	779	300KG7 W--	-17	-70	5		
LUT	1668	1675	5.5	411	779	300KG7 W--	-27	-80	15		
LUT1	1668	1675	5.5	411	779	300KG7 W--	-17	-70	5		
LUT1	1668	1675	5.5	411	779	300KG7 W--	6.7	-46.3	15		
LUT1	1668	1675	5.5	411	779	300KG7 W--	-17	-70	5		
LUT1	1668	1675	5.5	411	779	300KG7 W--	6.7	-46.3	15		
LUT2	1668	1675	5.5	411	779	300KG7 W--	-17	-70	5		
LUT2	1668	1675	5.5	411	779	300KG7 W--	6.7	-46.3	15		
LUT2	1668	1675	5.5	411	779	300KG7 W--	-17	-70	5		
LUT2	1668	1675	5.5	411	779	300KG7 W--	6.7	-46.3	15		

LUT3	1668	1675	5.5	411	779	300KG7 W--	-17	-70	5		
LUT3	1668	1675	5.5	411	779	300KG7 W--	6.7	-46.3	15		
LUT3	1668	1675	5.5	411	779	300KG7 W--	-17	-70	5		
LUT3	1668	1675	5.5	411	779	300KG7 W--	6.7	-46.3	15		
LUT4	1668	1675	5.5	411	779	300KG7 W--	-17	-70	5		
LUT4	1668	1675	5.5	411	779	300KG7 W--	6.7	-46.3	15		
LUT4	1668	1675	5.5	411	779	300KG7 W--	-17	-70	5		
LUT4	1668	1675	5.5	411	779	300KG7 W--	6.7	-46.3	15		
LUT6	1668	1675	5.5	411	779	300KG7 W--	-17	-70	5		
LUT6	1668	1675	5.5	411	779	300KG7 W--	6.7	-46.3	15		
LUT6	1668	1675	5.5	411	779	300KG7 W--	-17	-70	5		
LUT6	1668	1675	5.5	411	779	300KG7 W--	6.7	-46.3	15		
LUT5	1668	1675	5.5	411	779	300KG7 W--	-17	-70	5		
LUT5	1668	1675	5.5	411	779	300KG7 W--	-27	-80	15		
LUT5	1668	1675	5.5	411	779	300KG7 W--	-17	-70	5		
LUT5	1668	1675	5.5	411	779	300KG7 W--	-27	-80	15		

Table 128 Uplink Parameters of CSN-V1-1

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_emi	pwr_ds_min	pwr_ds_mn	e_as_stn.gain	Es_pattern_id	es.patter_n
LMU	1668	1675	25	600	286	1M00G7_W--	-19	-79	0	608	ND-EARTH
LMU	1668	1675	25	600	286	1M00G7_W--	-19	-79	4	608	ND-EARTH

Table 129 Uplink Parameters of CSN-V1-2

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_emi	pwr_ds_min	pwr_ds_mn	e_as_stn.gain	Es_pattern_id	es.patter_n
LMU	1668	1675	25	600	286	1M00G7_W--	-19	-79	0	608	ND-EARTH
LMU	1668	1675	25	600	286	1M00G7_W--	-19	-79	4	608	ND-EARTH

Table 130 Uplink Parameters of CSN-V1-3

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_emi	pwr_ds_min	pwr_ds_mn	e_as_stn.gain	Es_pattern_id	es.patter_n
LMU	1668	1675	25	600	286	1M00G7_W--	-19	-79	0	608	ND-EARTH
LMU	1668	1675	25	600	286	1M00G7_W--	-19	-79	4	608	ND-EARTH

Table 131 Uplink Parameters of CSN-V2-1

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_emi	pwr_ds_min	pwr_ds_mn	e_as_stn.gain	Es_pattern_id	es.patter_n
LMU	1668	1675	25	600	286	1M00G7_W--	-19	-79	0	608	ND-EARTH
LMU	1668	1675	25	600	286	1M00G7_W--	-19	-79	4	608	ND-EARTH

Table 132 Uplink Parameters of CSN-V2-2

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_em	pwr_ds_mi	pwr_ds_mi	e_as_stn.gain	Es_pattern_id	es.patter
LMU	1668	1675	25	600	286	1M00G7_W--	-19	-79	0	608	ND-EARTH
LMU	1668	1675	25	600	286	1M00G7_W--	-19	-79	4	608	ND-EARTH

Table 133 Uplink Parameters of CSN-V3-1

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_em	pwr_ds_mi	pwr_ds_mi	e_as_stn.gain	Es_pattern_id	es.patter
LMU	1668	1675	25	600	286	1M00G7_W--	-16	-76	0	608	ND-EARTH
LMU	1668	1675	25	600	286	1M00G7_W--	-16	-76	4	608	ND-EARTH

Table 134 Uplink Parameters of CSN-V3-2

beam_name	freq_min	freq_max	s_beam.gain	grp.noise_t	pattern_id	design_em	pwr_ds_mi	pwr_ds_mi	e_as_stn.gain	Es_pattern_id	es.patter
LMU	1668	1675	25	600	286	1M00G7_W--	-16	-76	0	608	ND-EARTH
LMU	1668	1675	25	600	286	1M00G7_W--	-16	-76	4	608	ND-EARTH

Attachment 3: Interference Analysis from TXIN to Other NGSO networks

The table 1 of this report has listed 41 NGSO networks which need to be coordinated. Among them the following 17 networks have already completed coordination. This report only contain the analysis results for the other 24 NGSO networks.

Table 135 NGSO Systems with Coordination Agreement

Number	Administration	NGSO System	Protection
1	CHN	ACONNECT	2018/2/6
2	CHN	ACONNECT-B	2019/1/30
3	CHN	ACONNECT-T	2018/2/6
4	CHN	GW-1	2019/4/29
5	CHN	GW-2	2020/9/11
6	CHN	GW-A59	2020/9/11
7	CHN	MCNT-02	2020/7/14
8	CHN	MCNT-03	2020/12/21
9	CHN	SIGNSAT-NGSO	2018/7/18
10	CHN	TXIN-WB	2019/1/13
11	CHN	CSN-V1-1	2021/12/20
12	CHN	CSN-V1-2	2021/12/20
13	CHN	CSN-V1-3	2021/12/20
14	CHN	CSN-V2-1	2021/12/20
15	CHN	CSN-V2-2	2021/12/20
16	CHN	CSN-V3-1	2021/12/20
17	CHN	CSN-V3-2	2021/12/20

1. Downlink Analysis

Among the 24 NGSO networks, some of them only have omnidirectional antennas. We selected C-SAT-LEO, F-SAT-NG-14 networks to represent this type of networks for the analysis. The results also applies to COMPASS-MEO、C-SAT-LEO、DES-LEO、GEESAT-1、JK-1、JUVENILE-OFO、OKSAT、QXSI-LOW-ORBITAL-EX-L、XINGYUN、D-ISIPELE-C、HISPASAT-LEO-NB、SATELIOT_L_S、EB-SAT-

LEO-1、EB-SAT-LEO-1B、F-SAT-NG-14、HOL-MG-A006、CLEOSAT、SI-SAT-KURUKURU、AST-NG-C-4、JUKEBOX、CSN-V1-1、CSN-V1-2、CSN-V1-3、CSN-V2-1、CSN-V2-2、CSN-V3-1、CSN-V3-2 networks.

We also analyzed SPACEWAY、XINGYUN-2、D-MEG1-1、FALAK-1 networks where different directional antennas are used.

1.1.Downlink Parameters

The following table lists the parameters used in the simulation analysis

Table 136 Simulation Parameters of NGSO System networks

	Interfering		Victim									
Satellite Networks	TXIN 850km	TXIN 1175km	C-SAT- LEO	F-SAT- NG-14	SPACEWAY	XINGYUN-2	D-MEG1-1	FALAK-1	XINGYU N			
Downlink												
Downlink Center Frequency (GHz)	1.5215	1.5215	1.5215	1.5215	1.5215	1.5215	1.5215	1.5215	1.5215	1.5215	1.5215	1.5215
Tx Sat Gain (dBi)	25	25	32	17	10	10	3	3	40	40	7	7
Tx Sat.Ref.Pattern	REC-1528	REC-1528	REC-1528	REC-1528	REC-1528	REC-1528			REC-672	REC-672		
Power_ds_max/ Power_ds_min (dBW/Hz)	-56	-58*	-70	-53.9	-78	-78	-84	-81.6	-86.9	-91.8	-109	-109
Rx ES Gain (dBi)	0	0	24	0	-2	12	0	8	5	11.9	0	12
Rx ES.Ref.Pattern	ND-EARTH	ND-EARTH	ND-EARTH	ND-EARTH	ND-EARTH	ABCDphi 1	ND-EARTH	REC-580	ND-EARTH	REC-580	ND-EARTH	APEUAE2 29V01
Rx ES. Sys.Noise T(K)	400	400	100	500	250	160	400	130	250	250	500	500
ES elev_min (°)	10	15	10	10	10	10	10	10	10	10	10	10

1.2.Downlink Simulation Results

1.2.1.Downlink Interference to C-SAT-LEO Network (ND-EARTH)

The following chart compares the simulation results for TXIN850 and TXIN1175.

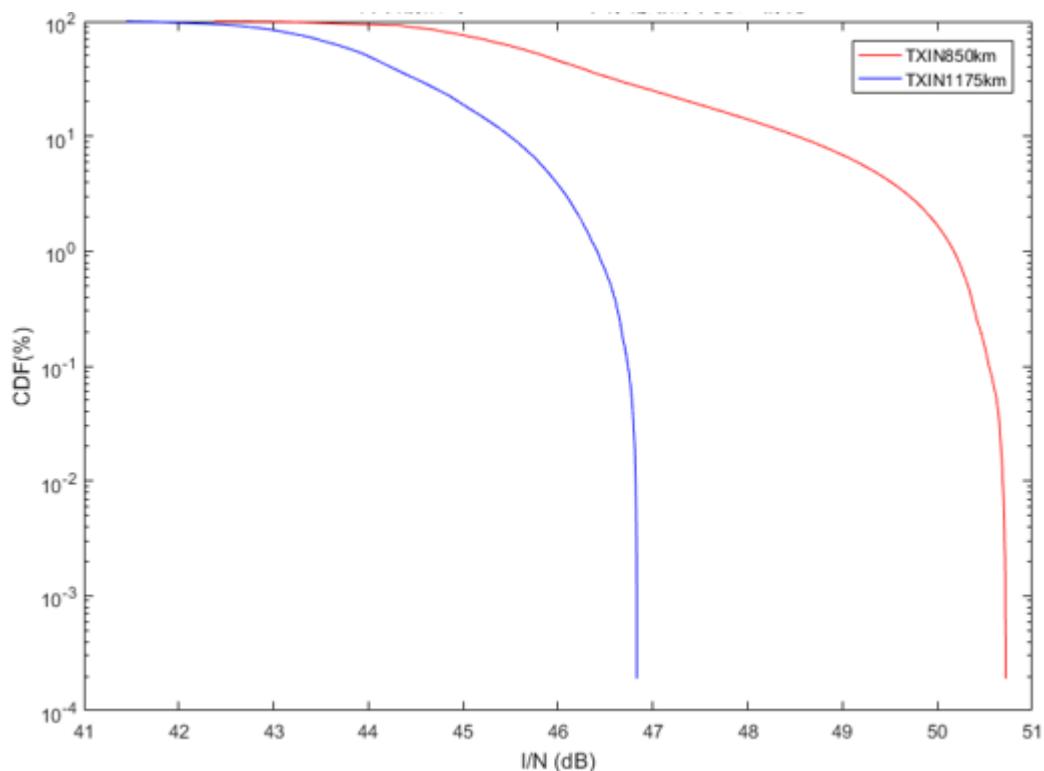


Figure 10 Downlink I/N from TXIN sats into C-SAT-LEO ES (ND-EARTH)

1.2.2.Downlink Interference to F-SAT-NG-14 Network (ND-EARTH)

The following chart compares the simulation results for TXIN850 and TXIN1175.

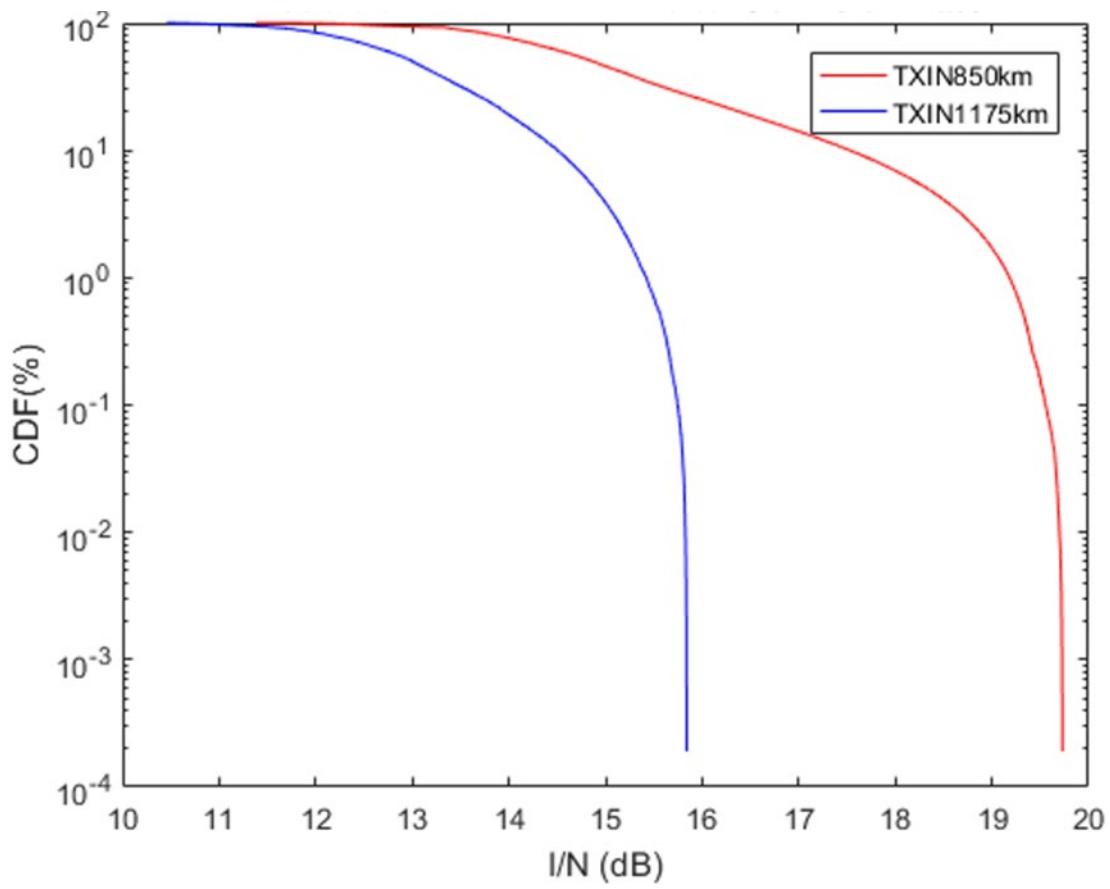


Figure 11 Downlink I/N from TXIN sats into F-SAT-NG-14 ES (ND-EARTH)

1.2.3. Downlink Interference to SPACEWAY Network

The following chart compares the simulation results of downlink interference from TXIN850 and TXIN1175 to an earth station using omnidirectional antenna.

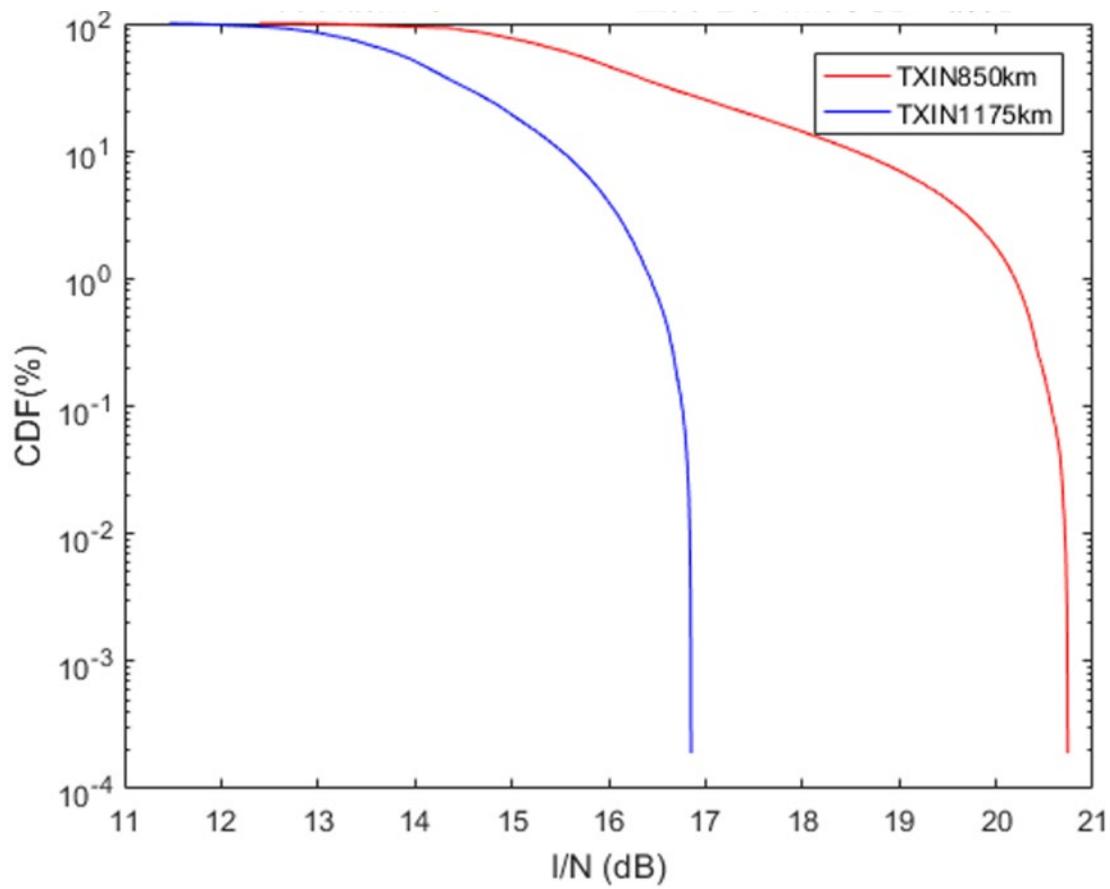


Figure 12 Downlink I/N from TXIN sats into SPACEWAY ES (ND-EARTH)

The following chart compares the simulation results of downlink interference from TXIN850 and TXIN1175 to an earth station using ABCDphi antenna.

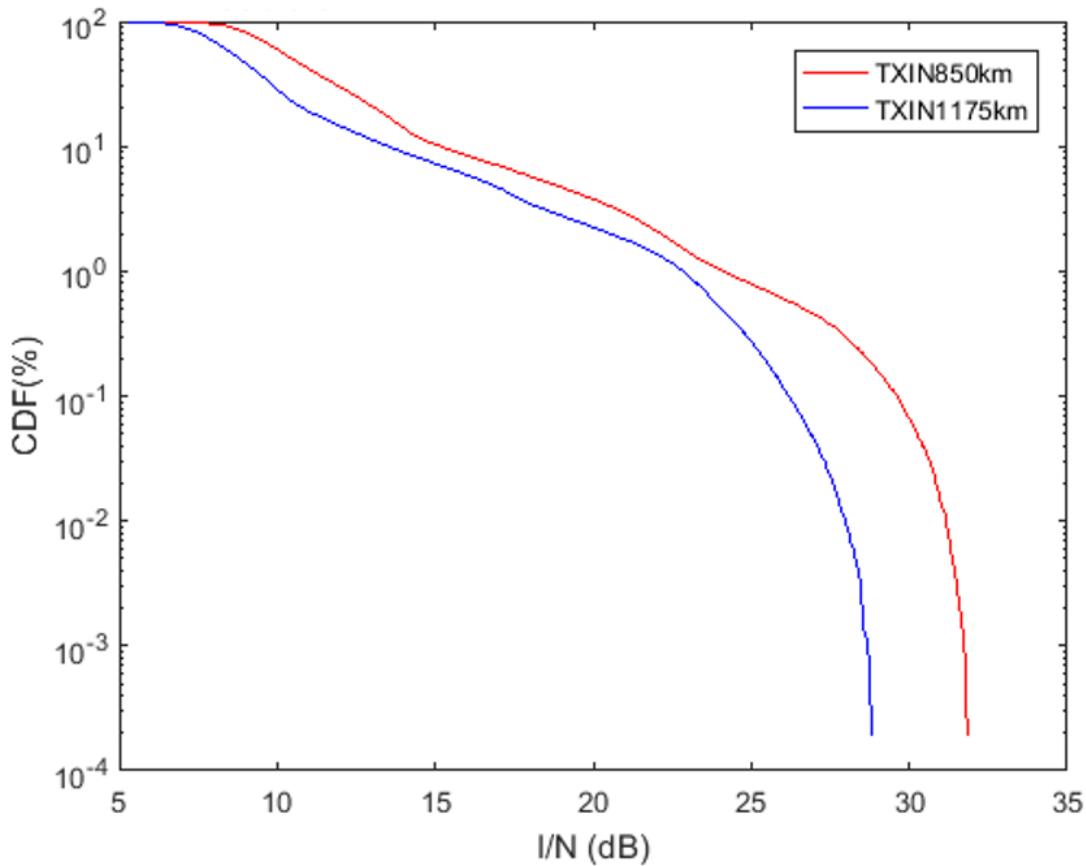


Figure 13 Downlink I/N from TXIN sats into SPACEWAY ES (ABCDphi)

1.2.4.Downlink Interference to XINGYUN-2 Network

The following chart compares the simulation results of downlink interference from TXIN850 and TXIN1175 to an earth station using omnidirectional antenna.

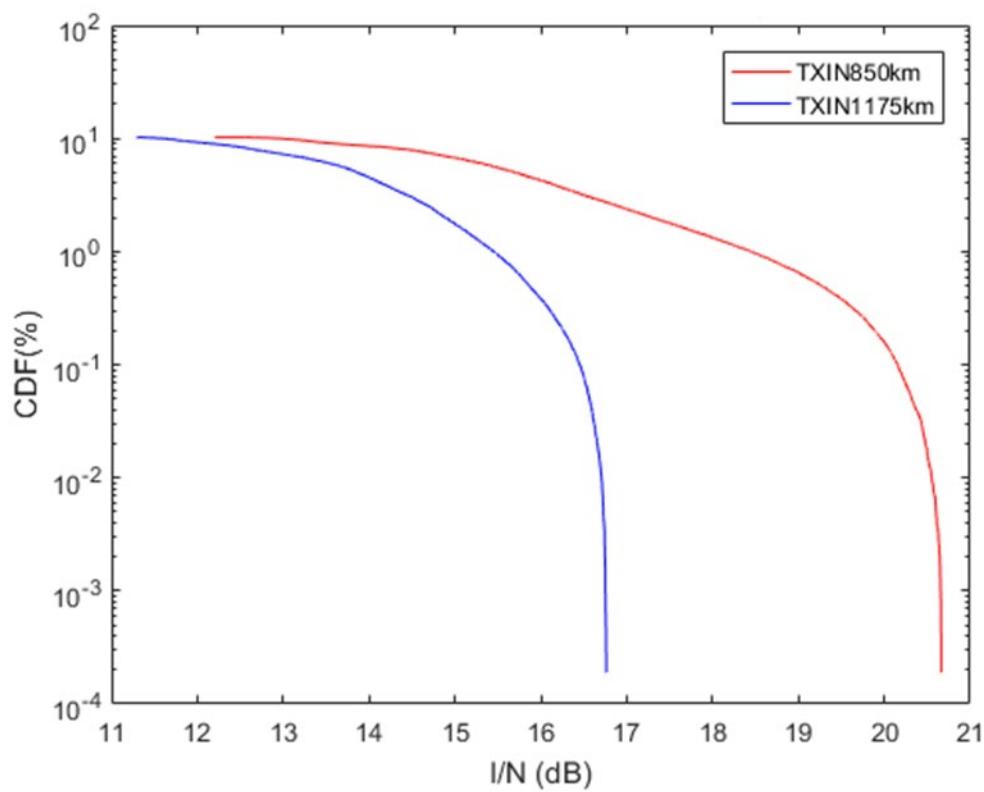


Figure 14 Downlink I/N from TXIN sats into XINGYUN-2 ES (ND-EARTH)

The following chart compares the simulation results of downlink interference from TXIN850 and TXIN1175 to an earth station using REC-580-6 antenna.

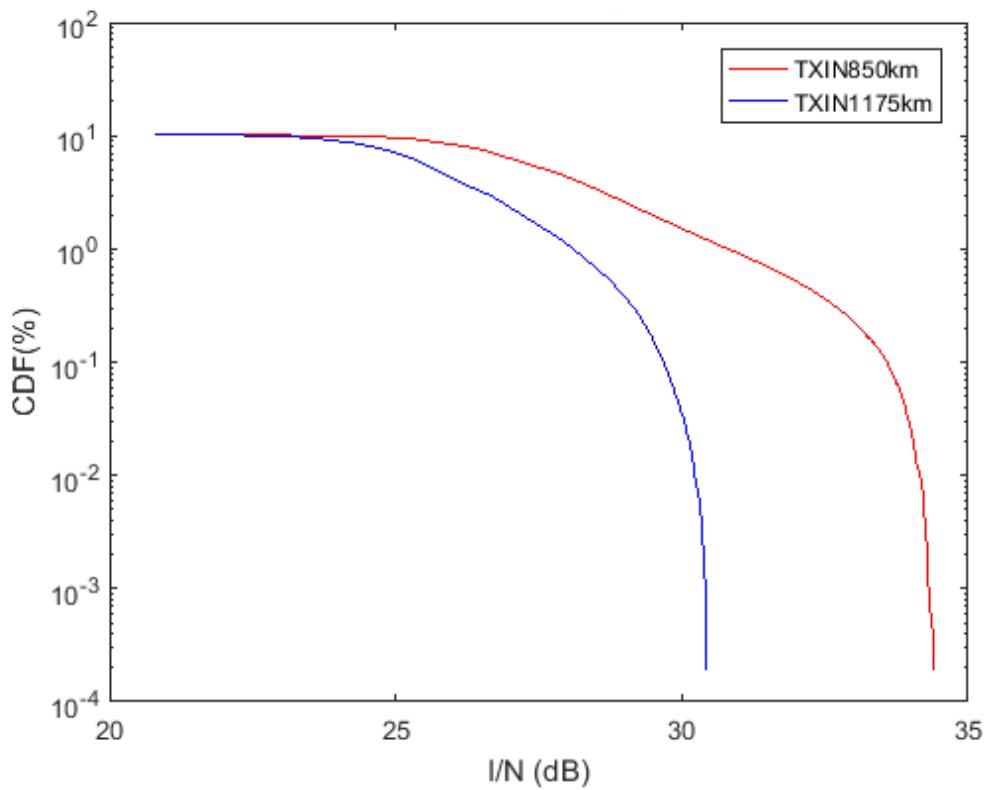


Figure 15 Downlink I/N from TXIN sats into XINGYUN-2 ES (REC-580-6)

1.2.5.Downlink Interference to D-MEG1-1 Network

The following chart compares the simulation results of downlink interference from TXIN850 and TXIN1175 to an earth station using omnidirectional antenna.

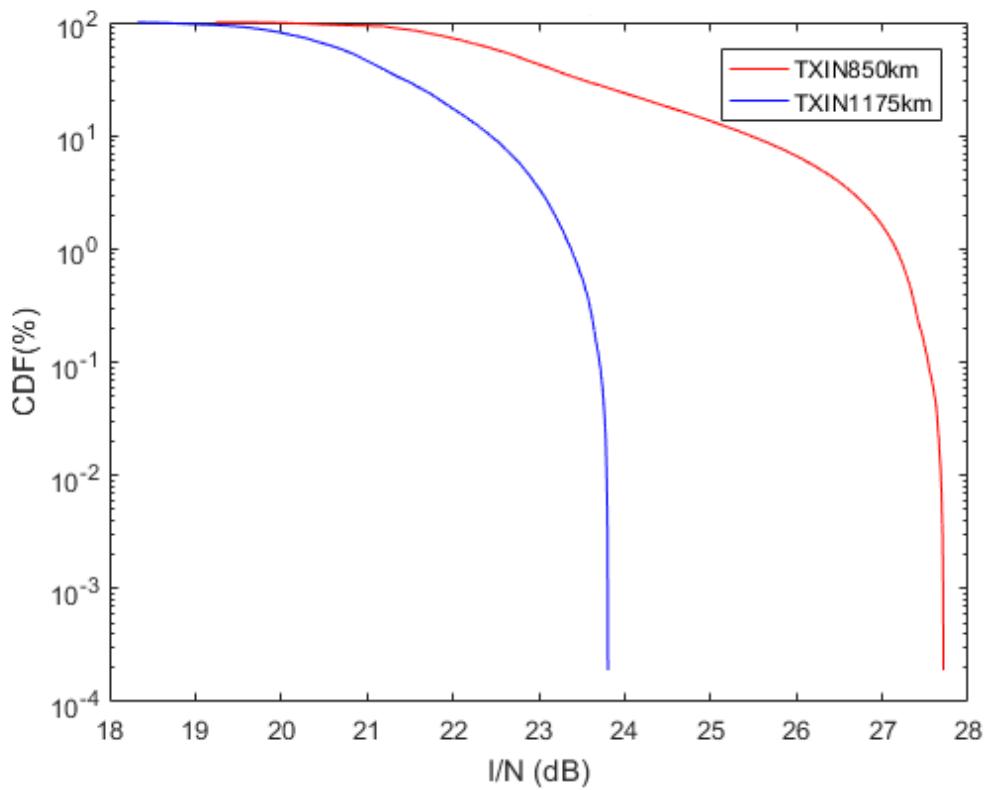


Figure 16 Downlink I/N from TXIN sats into D-MEG1-1 ES (ND-EARTH)

The following chart compares the simulation results of downlink interference from TXIN850 and TXIN1175 to an earth station using REC-580-6 antenna.

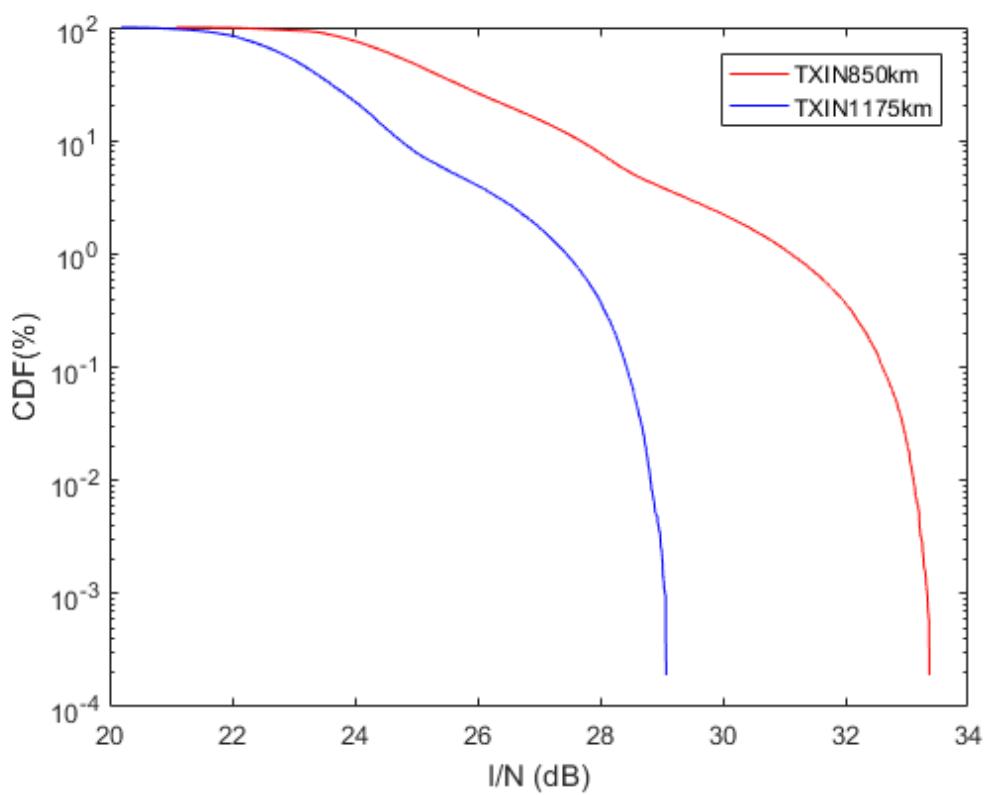


Figure 17 Downlink I/N from TXIN sats into D-MEG1-1 ES (REC-580-6)

1.2.6.Downlink Interference to FALAK-1Network

The following chart compares the simulation results of downlink interference from TXIN850 and TXIN1175 to an earth station using omnidirectional antenna.

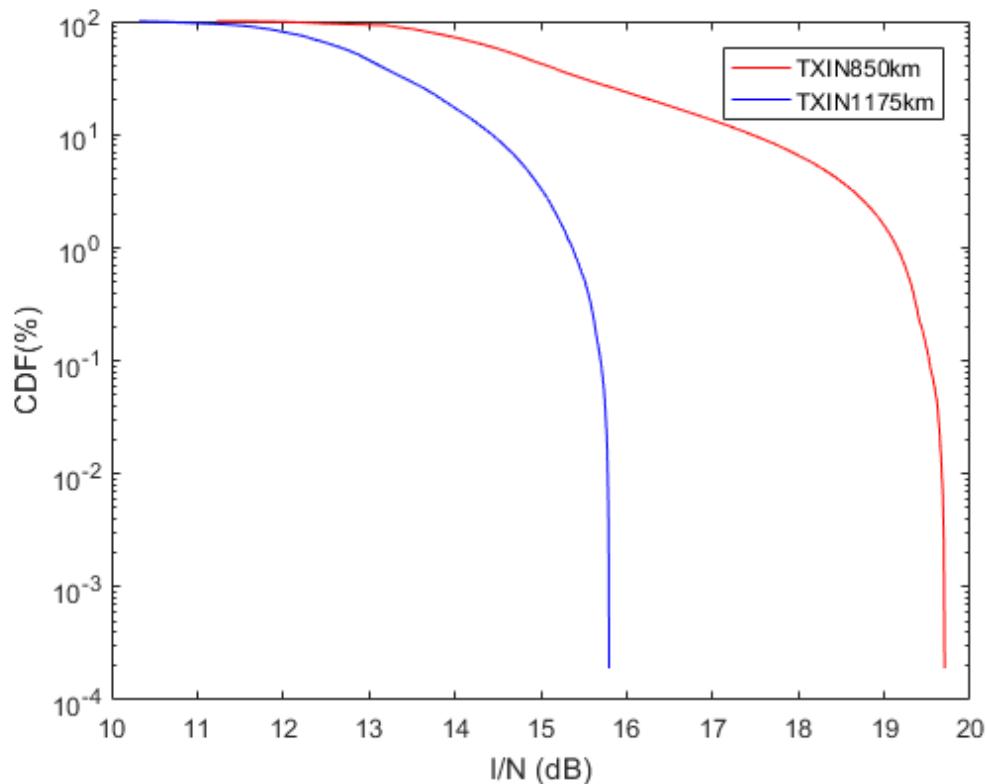


Figure 18 Downlink I/N from TXIN sats into FALAK-1 ES (ND-EARTH)

The following chart compares the simulation results of downlink interference from TXIN850 and TXIN1175 to an earth station using APEUAE229V01 antenna.

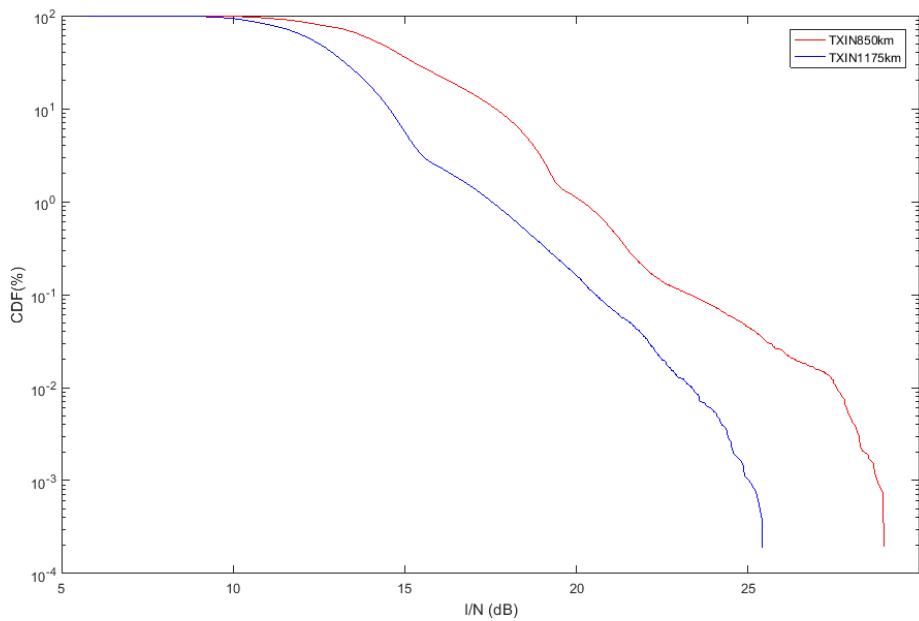


Figure 19 Downlink I/N from TXIN sats into FALAK-1 ES (APEUAE229V01)

1.2.7.Downlink Analysis Conclusion

Upon raising TXIN orbital height from 850 km to 1175 km and reducing the downlink power spectral density by 2 dB, the downlink interference to all networks are decreased.

2. Uplink Analysis

Upon TXIN raising orbital height, its terminal transmission, antenna characteristics, terminal distribution and density will not change. Therefore the uplink interference should not change.

To prove the point, we analyzed the following 4 types of networks:

- 1) same orbit height and inclination - SPACEWAY
- 2) same orbit height but different inclination - F-SAT-NG-14
- 3) different orbit height and same inclination - C-SAT-LEO
- 4) different orbit height and different inclination - XINGYUN

2.1.Uplink Parameters

The following table list the parameters used in the uplink analysis

Table 137 Simulation Parameters of NGSO System networks

	Interfering		Victim			
Satellite Networks	TXIN 850km	TXIN 1175km	C-SAT-LEO	F-SAT-NG-14	SPACEWAY	XINGYUN
Uplink						
Uplink Center Frequency (GHz)	1.6715	1.6715	1.6715	1.6715	1.6715	1.6715
Rx Sat Gain (dBi)	25	25	26	21.9	10	22.8
Rx Sat.Ref.Pattern	REC-1528	REC-1528	REC-1528		REC-1528	/
Power_ds_max/ Power_ds_min (dBW/Hz)	-47	-47	-60	-60.3	-57.2	-76.9
ES Tx Gain (dBi)	0	0	24	0	2	0
ES.Tx Ref .Pattern	ND-EARTH	ND-EARTH	ND-EARTH	ND-EARTH	ND-EARTH	ND-EARTH
Rx Sat. Sys. Noise T(K)	600	600	600	290	650	400
ES elev_min (°)	10	15	10	10	10	10
ES location	(55°N,116°E)	(55°N,116°E)	(55°N,116°E)	(55°N,116°E)	(55°N,116°E)	(55°N,116°E)

2.2.Uplink Simulation Results

2.2.1.Uplink Interference to SPACEWAY network

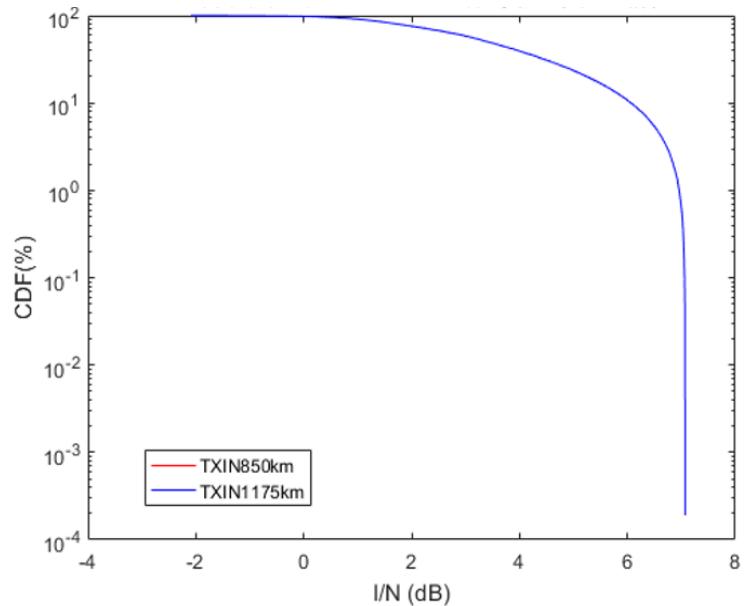


Figure 20 Uplink I/N from TXIN ES into FALAK-1 Sats

2.2.2.Uplink Interference to F-SAT-NG-14 network

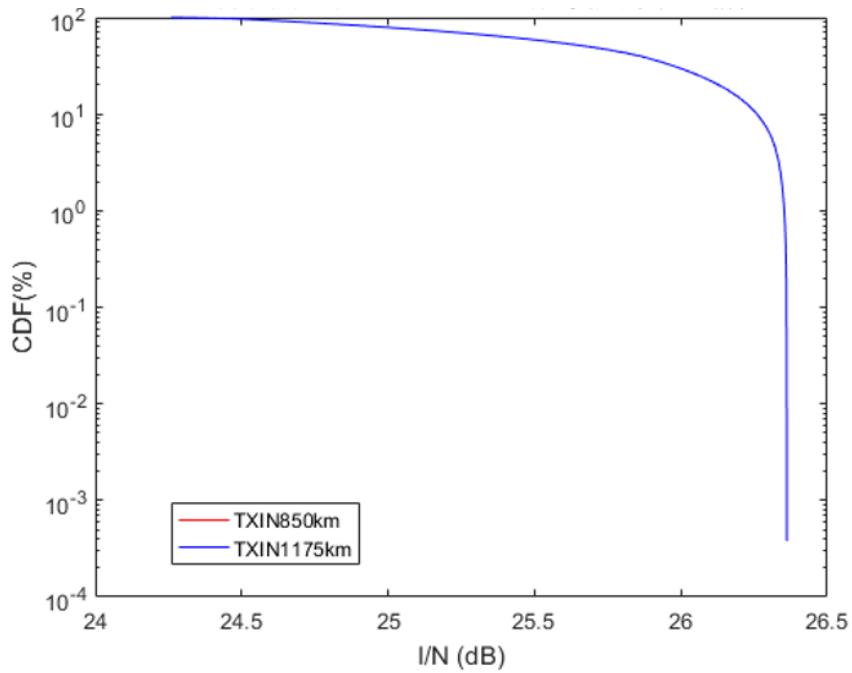


Figure 21 Uplink I/N from TXIN ES into F-SAT-NG-14 Sats

2.2.3.Uplink Interference to C-SAT-LEO network

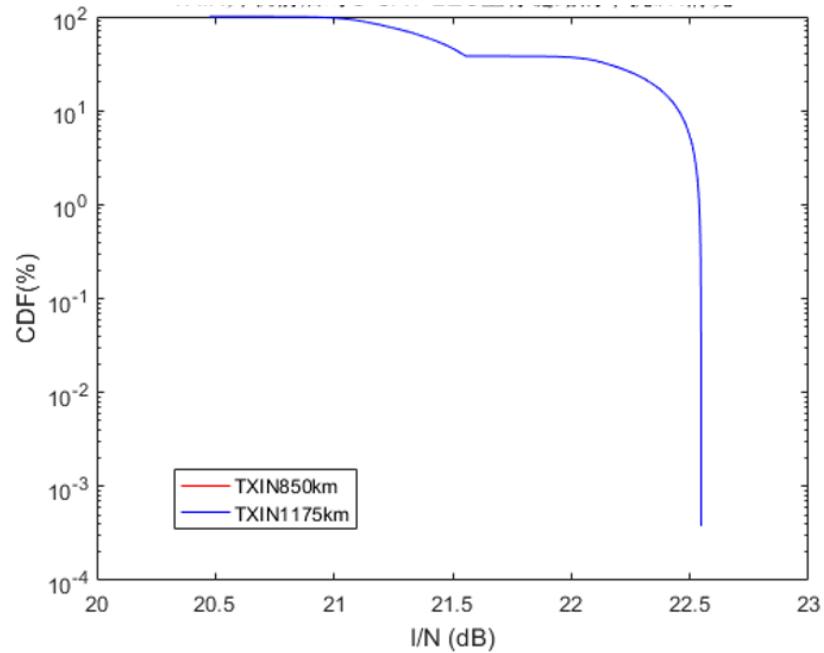


Figure 22 Uplink I/N from TXIN ES into C-SAT-LEO Sats

2.2.4.Uplink Interference to XINGYUN network

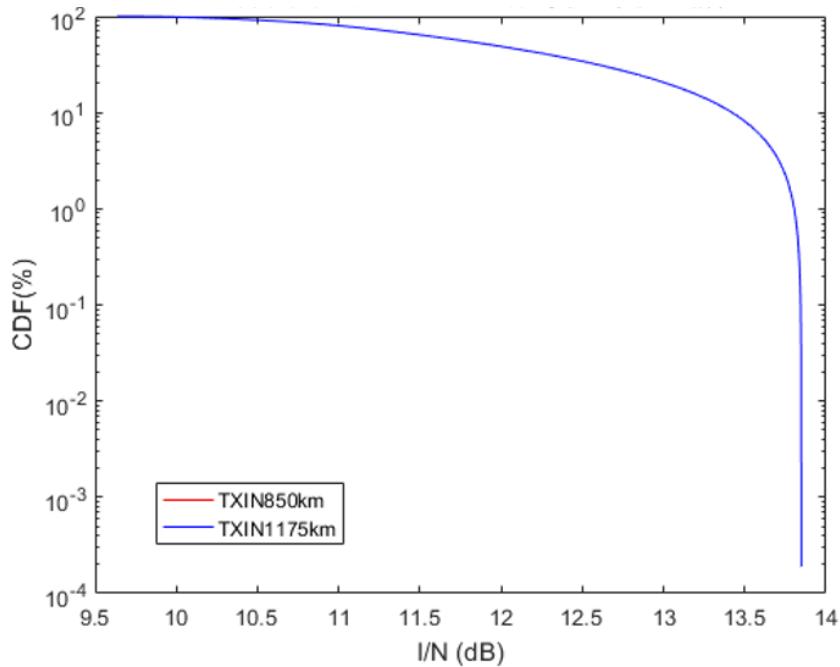


Figure 23 Uplink I/N from TXIN ES into XINGYUN Sats

2.2.5.Uplink Conclusion

As shown in section 2.2 Uplink Simulation Results, changing orbit height does not increase the uplink interference.

3. Conclusion

The analysis results presented above clearly show that upon the orbit height change from TXIN850 to TXIN1175 will not increase the uplink or downlink interferences to other NGSO networks.

Attachment 4: GSO network's Parameters

Table 3 of the main text provided all GSO networks needing coordination for the proposed orbit change. Among the 334 GSO networks listed, the following networks have completed the coordinations:

Table 138 GSO Systems with Coordination Agreement

Number	Administration	NGSO System	Long_nom	Protection
1	CHN	CNSAT-76.5W	-76.5	2021/6/29
2	CHN	CNSAT-76.5W	-76.5	2021/6/29
3	CHN	CNSAT-89.8E	89.8	2021/6/29
4	CHN	CNSAT-152.8E	152.8	2021/6/29
5	CHN	CNSAT-152.8E	152.8	2021/6/29
6	CHN	CNSAT-158E	158	2021/6/29

For the remaining GSO networks, we selected CHNNEWSAT-G2-125W network as an example to perform the uplink and downlink interference analysis on omnidirectional antenna and directional antennas. The results should also apply to other GSO networks.

1. Link Parameters

1.1. Downlink Parameters

Table 139 Downlink Parameters of CHNNEWSAT-G2-125W

beam_na_me	freq_min	freq_max	s_beam.gain	patter_n_id	patter_n	e_as_stn.gain	e_as_stn.noise_t	design_emi	pep_mi_n	pwr_ds_min	c_to_n	ant_type.pattern
LDSP	1518	1525	44			18	724	200KD7W--	-4	-56.8	8	APENST813V01
LDSP	1518	1525	44			8	398	200KD7W--	-4	-56.8	4	APEG 215V01
LDSP	1518	1525	44			14	398	200KD7W--	-4.4	-57.4	6.5	APEG 216V01
LDSP	1518	1525	44			2	316	200KG7W--	-4.5	-56.5	4.1	ND-EARTH
LDSP	1518	1525	44			0	200	5K00G1D--	-14.1	-42.9	3.5	ND-EARTH
LDWB	1518	1525	22			8	398	50K0G7W--	-2.3	-48.5	-0.1	APEG 215V01
LDWB	1518	1525	22			14	398	50K0D7W--	-2.3	-48.5	5.4	APEG 216V01
LDWB	1518	1525	22			18	724	50K0D7W--	-2.3	-48.5	4.4	APENST813V01
LDWB	1518	1525	22			0	200	5K00G1D--	-14.1	-42.9	3.5	ND-EARTH
LDWB	1518	1525	22			29	501	1K00N0N--	-14.7	-44.7	15	APENST816V01
LDWB	1518	1525	22			2	316	200KG7W--	-4.5	-56.5	4.1	ND-EARTH

1.2.Uplink Parameters

Table 140 Uplink Parameters of CHNNEWSAT-G2-125W

beam_na_me	freq_min	freq_ma_x	s_beam.gain	grp.noise_t	pattern_id	Sat_pat tern	design_emi	pwr_ds_min	pwr_ds_min	c_to_n	e_as_stn.gain	Es pattern
LUSP	1668	1675	44	630			100KD7W--	-5.7	-55.7	3.3	8	APEG 215V01
LUSP	1668	1675	44	630			100KD7W--	-5.6	-55.6	8.9	14	APEG 216V01
LUSP	1668	1675	44	630			50K0G7W--	-7	-53.4	4.1	2	ND-EARTH
LUSP	1668	1675	44	630			5K00G1D--	4.3	-24.5	3.5	0	ND-EARTH
LUSP	1668	1675	44	630			200KD7W--	-3	-55.8	7.3	18	APENST813V01
LUWB	1668	1675	22	630			5K00G1D--	-2.2	-31	3.5	0	ND-EARTH
LUWB	1668	1675	22	630			25K0G7W--	-4	-47.2	0.5	8	APEG 215V01
LUWB	1668	1675	22	630			50K0G7W--	-3.9	-50.1	3.1	14	APEG 216V01
LUWB	1668	1675	22	630			200KG7W--	-5.5	-58.3	-0.9	18	APENST813V01
LUWB	1668	1675	22	630			1K00N0N--	-12.5	-42.5	15	29	APENST816V01
LUWB	1668	1675	22	630			50K0G7W--	-7	-53.4	4.1	2	ND-EARTH

Attachment 5: Interference Analysis from TXIN to GSO networks

1. Downlink Analysis

1.1. Downlink Parameters

Table 141 Simulation Parameters of CHNNEWSAT-G2-125W System network

	TXIN		Interferenced network	
	Original TXIN	Modification	CHNNEWSAT-G2-125W	
Downlink				
Downlink Center Frequency (GHz)	1.5215	1.5215	1.5215	1.5215
Tx Sat Gain (dBi)	25	25	44	22
Tx Sat.Ref.Pattern	REC-1528	REC-1528	REC-1528	REC-1528
Power_ds_max/ Power_ds_min (dBW/Hz)	-56	-58*	-56.5	-44.7
ES Rx Gain (dBi)	0	0	2	29
Rx ES.Ref.Pattern	ND-EARTH	ND-EARTH	ND-EARTH	APENST816V01
Rx ES. Sys.Noise T(K)	400	400	316	501
ES elev_min (°)	10	15	10	10
ES location	(0°N,125°W)	(0°N,125°W)	(0°N,125°W)	(0°N,125°W)

1.2.Downlink Simulation Results

1.2.1.Downlink Interference to APENST816V01 antennas

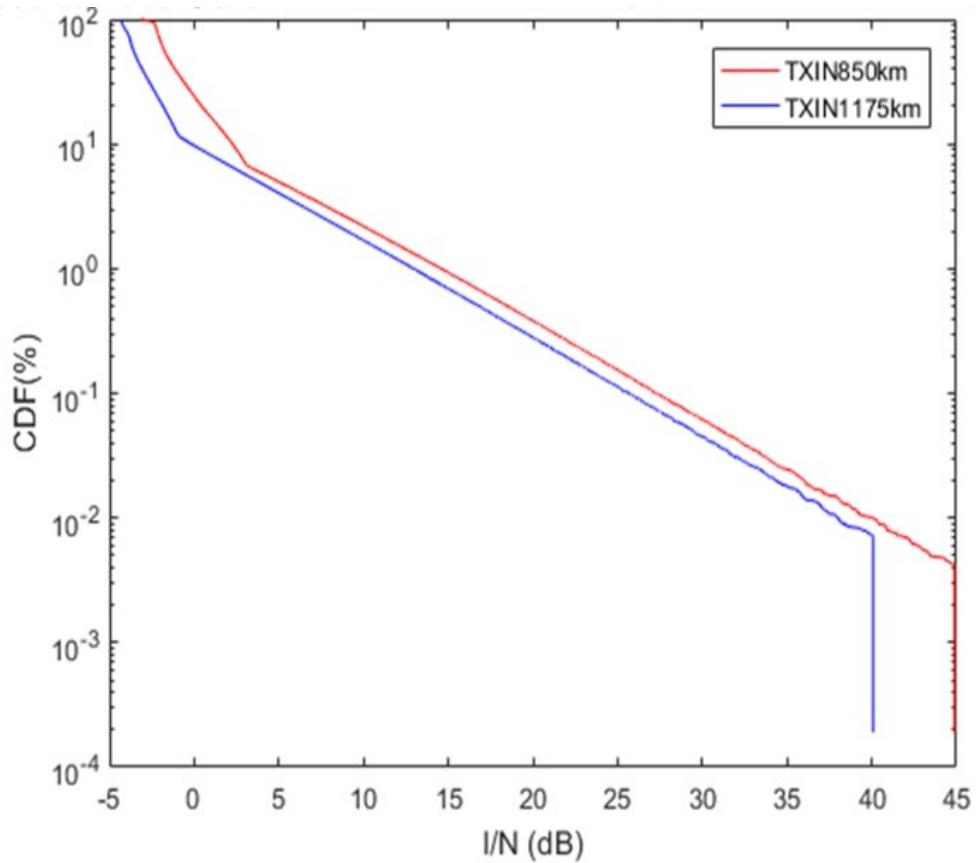


Figure 24 Downlink I/N from TXIN sats into CHNNEWSAT-G2-125W ES (APENST816V01)

1.2.2.Downlink Interference to omnidirectional antennas

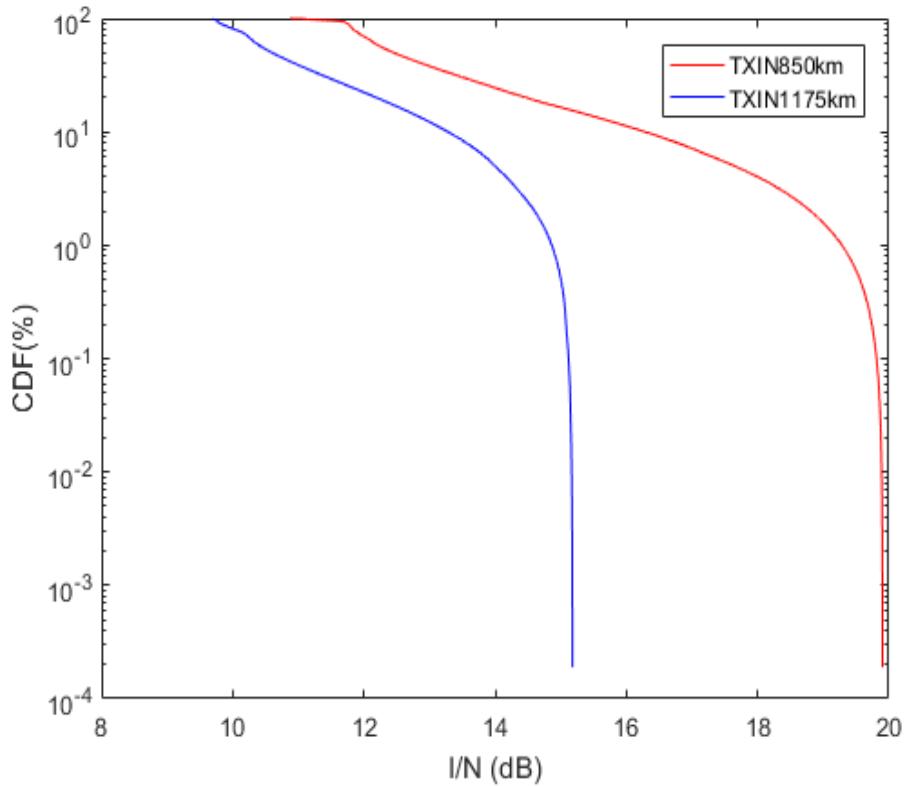


Figure 25 Downlink I/N from TXIN sats into CHNNEWSAT-G2-125W ES (ND-EARTH)

2. Uplink Analysis

Upon TXIN raising orbit height, its terminal transmission, antenna characteristics, terminal distribution and density will not change. Therefore the uplink interference to the same GSO uplink beams will not change.

3. Conclusion

The analysis results presented above clearly show that upon the orbit height change from TXIN850 to TXIN1175 will not increase the uplink or downlink interferences to the GSO networks.