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ITUEvents

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3 - 5 December 2025
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#ITUWRC

WRC-27 agenda item 1.18
Resolves 2

Studies on compatibility between the Earth exploration-satellite service (passive), the radio astronomy service in certain bands above 76 GHz, and active services in adjacent and nearby frequency bands

Dr Balthasar Indermuehle
Chair WP7D

Mr Ivan Thomas
Dr Ashley Vanderley
Co-Chairs WG7D-2

AI 1.18 resolves 2: Introduction of panelists

- APT: Dr Wahyudi Hasbi
- ATU: Ms Stella Banyenza
- ASMG: Dr Ramzi Halimouche
- CITEL: Ms Xochitl Hernandez
- CEPT: Mr Karsten Buckwitz
- RCC: Mr Anton Stepanov

AI 1.18 resolves 2 brief recap: Resolution 712

… to consider, based on the results of ITU Radiocommunication Sector studies, possible regulatory measures regarding the protection of the Earth exploration-satellite service (passive) and the radio astronomy service in certain frequency bands above 76 GHz from unwanted emissions of active services, in accordance with Resolution **712 (WRC-23)**;

AI 1.18 resolves 2 brief recap

resolves

2) compatibility studies between the RAS and the active satellite services in certain adjacent and nearby frequency bands listed in Table 2 below with a view to setting the relevant threshold levels for unwanted emissions from any GSO and non-GSO space stations and revising and updating Resolution **739 (Rev. WRC-19)** accordingly

TABLE 2

RAS frequency bands to be studied and corresponding active services to be included

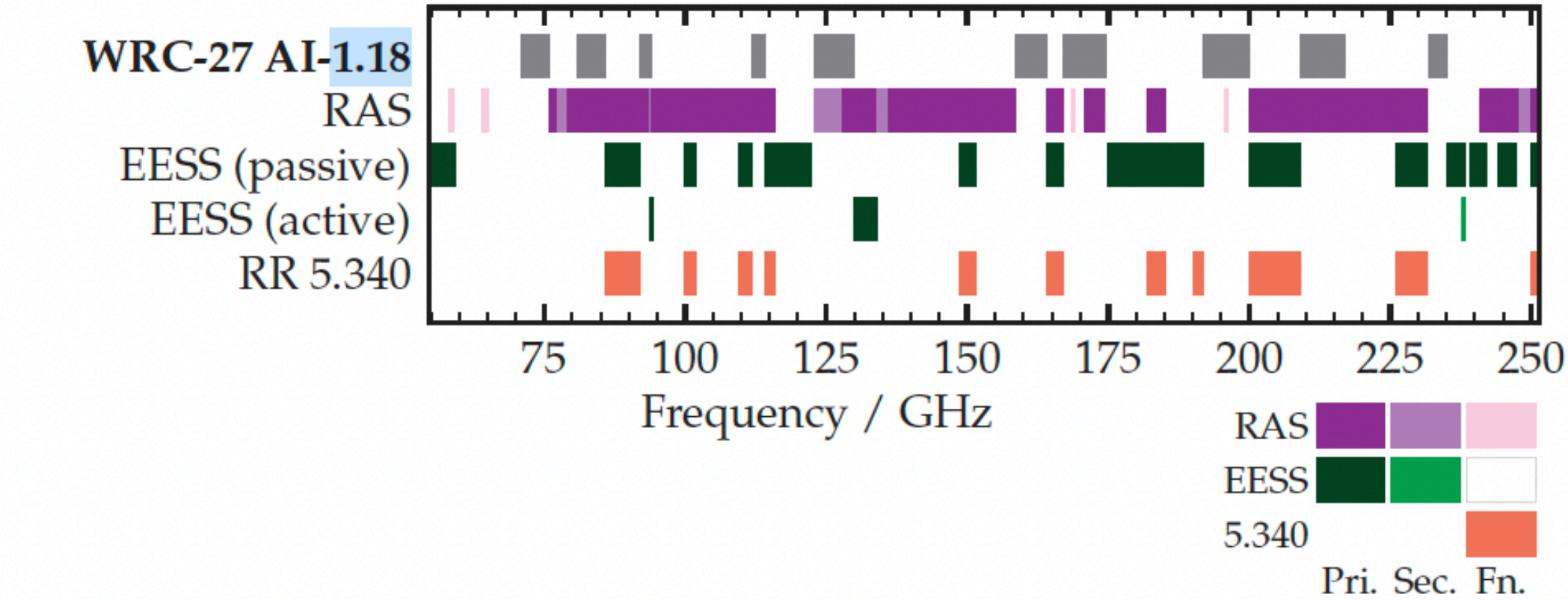
Radio astronomy frequency band	Active satellite service frequency band	Active satellite service (space-to-Earth)
76-81 GHz	71-76 GHz	Fixed-satellite service (FSS), mobile-satellite service (MSS), broadcasting-satellite service (BSS)
130-134 GHz	123-130 GHz	FSS, MSS, radionavigation-satellite service (RNSS)
164-167 GHz	167-174.5 GHz	FSS
226-231.5 GHz	232-235 GHz	FSS

AI 1.18 resolves 2 brief recap

invites

2) to determine, based on the results of studies, any required regulatory measures regarding the protection of the RAS in the frequency bands listed in Table 2 above and update Resolution **739 (Rev. WRC-19)** accordingly,

AI 1.18: Frequency bands overview



Views of the U.S. National Academies of Sciences, Engineering, and Medicine on Agenda Items at Issue at the World Radiocommunication Conference 2027; https://doi.org/10.17226/28596

AI 1.18: 76 – 81 GHz

For reference, see ITU-R Rec RA.314

Continuum observations

- Spectral energy distribution of pulsars, supernova remnants, ionised gas, and thermal sources
- One of the best high frequency bands for these observations due to little O_2 and H_2O atmospheric absorption

Spectral line observations

- HDO (deuterated water)

AI 1.18: 130 – 134 GHz

For reference, see ITU-R Rec RA.314

Continuum observations

- Spectral energy distribution of pulsars, supernova remnants, ionised gas, and thermal sources

Spectral line observations

- H_2CO and $H_2{}^{13}CO$ (Formaldehyde)
- CS (carbon monosulfide) Astrochemistry, complex molecules in interstellar clouds

AI 1.18: 164 – 167 GHz

For reference, see ITU-R Rec RA.314

Continuum observations

- Spectral energy distribution of pulsars, supernova remnants, ionised gas, and thermal sources

Spectral line observations

- H_2CO and $H_2{}^{13}CO$ (Formaldehyde)
- CS (carbon monosulfide) Astrochemistry, complex molecules in interstellar clouds

AI 1.18: 226 – 231.5 GHz

For reference, see ITU-R Rec RA.314

Continuum observations

- Spectral energy distribution of pulsars, supernova remnants, ionised gas, and thermal sources

Spectral line observations

- CO ($^{12}C^{16}O$), ^{13}CO, and $C^{18}O$ (Carbon monoxide and its isotopologues). The most important star formation tracer molecule (traces molecular hydrogen H_2). Observing multiple CO lines enables study of the physical conditions (temperature and density). ^{12}CO (or just CO) is optically thick – its isotopologues less so and allow looking deeper into the clouds. Their ratios provide information on nucleosynthesis. H_2 is unobservable at the cold temperatures in clouds (10-50K), so the proxy measurement using CO is critical.
- CS (carbon monosulfide) Astrochemistry, complex molecules in interstellar clouds

AI 1.18: 226 – 231.5 GHz

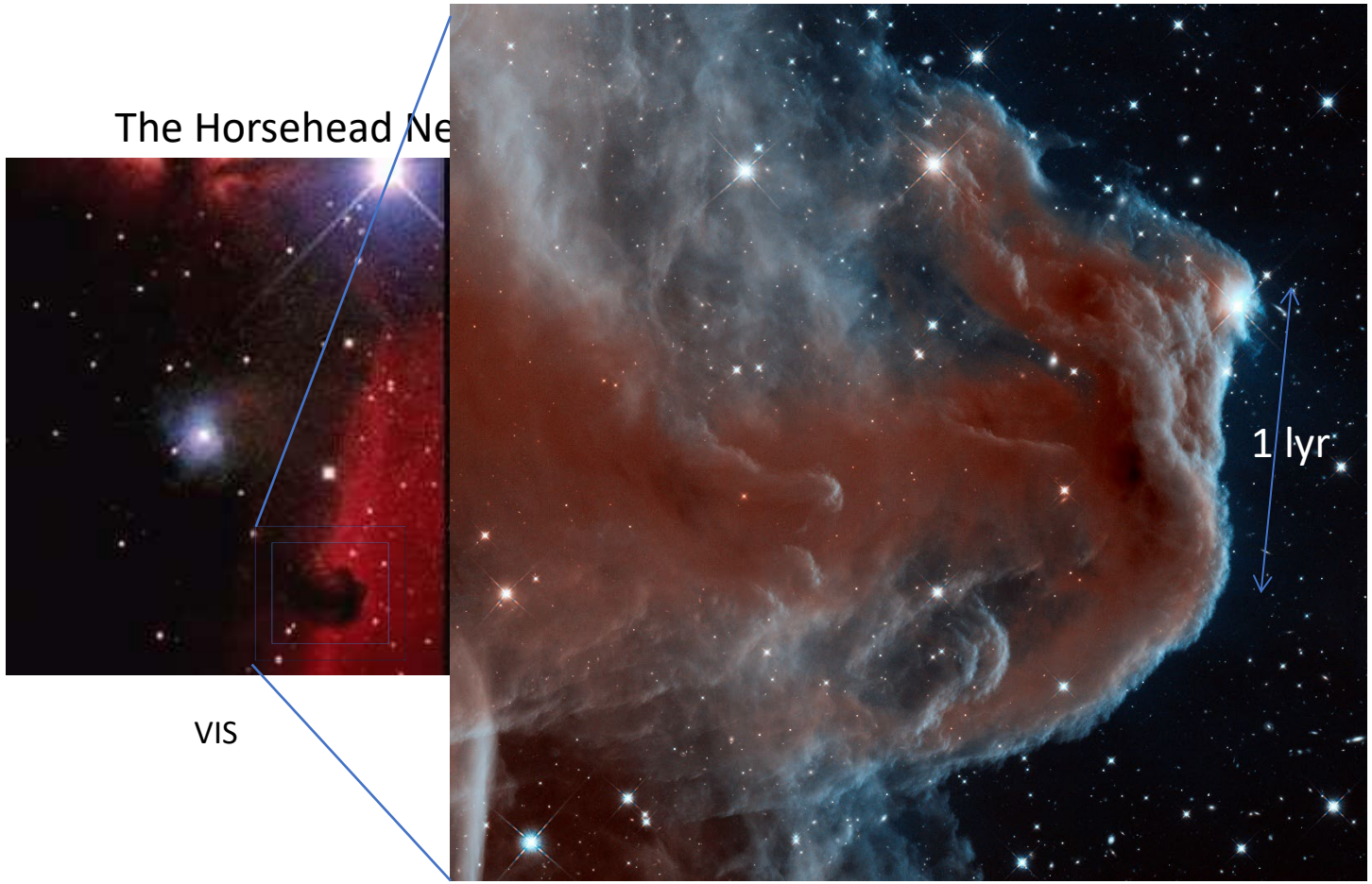
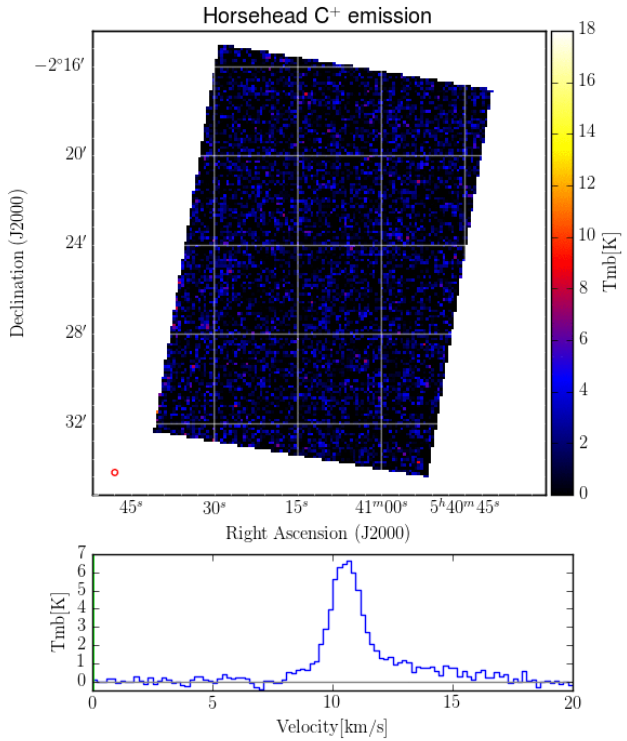


Image courtesy 2MASS, IPAC (Caltech), Hubble Heritage Archive



Velocity resolved map of Horsehead Nebula GREAT/SOFIA at (157µm / 1.9 THz) to image CII and CO_{11-10}
Bally, John, et al., 2018, AJ, 155, 80

AI 1.18: Status

- Revision of the Recommendation ITU-R RA.1631
  - Largely agreed as PDR Rec ITU-R RA.1631 at the Sep 2025 meeting
- WD PDN Report RAS-SAT from 71-235 GHz
  - epfd methodology above 76 GHz agreed at Sep 2025 meeting
- Update of Resolution 739
  - No proposed changes at this time
- CPM Text
  - No methods have been developed yet