QUESTION ITU-R 201-6/3

Radiometeorological data required for the planning of terrestrial and
space communication systems and space research application

(1966-1970-1974-1978-1982-1990-1995-2000-2007-2012-2016)

The ITU Radiocommunication Assembly,

considering

*a)* that the characteristics of the tropospheric radio channel depend on a variety of meteorological parameters;

*b)* that statistical predictions of radiopropagation effects are urgently required for planning and design of radiocommunication and remote sensing systems;

*c)* that, for the development of such predictions, knowledge of all atmospheric parameters affecting channel characteristics, their natural variability and their mutual dependence is needed;

*d)* that the quality of measured and suitably analysed radiometeorological data is one of the determinants of the ultimate reliability of propagation prediction methods that are based on meteorological parameters;

*e)* that an accurate knowledge of the clear-sky level on a satellite-to-ground link is important in developing the margin required to enable a telecommunications service to operate satisfactorily under adverse propagation conditions;

*f)* that the clear-sky level on a satellite-to-ground link can fluctuate significantly both diurnally and seasonally due to atmospheric effects;

*g)* that interest exists in extending the range of frequencies used for telecommunication and remote sensing purposes;

*h)* that propagation conditions should be known as well as possible during the process of bringing into service (BIS) of radio-relay equipment,

decidesthat the following Questions should be studied

1 What are the distributions of tropospheric refractivity, its gradients and their variability, both in space and time?

2 What are the distributions of atmospheric constituents and particles, such as water vapour and other gases, clouds, fog, rain, hail, aerosols, sand, etc., both in space and time?

3 What is the magnitude of the variations in clear-sky level on a satellite-to-ground link that can occur on a diurnal, monthly and seasonal basis?

4 How do the climatology and natural variability (year-to-year, seasonal, monthly and diurnal variations, long-term variations) of all atmospheric constituents affect attenuation and interference predictions?

5 What models best describe the relationship between atmospheric parameters and radiowave characteristics (amplitude, polarization, phase, angle of arrival, etc.)?

6 What methods based on meteorological information can be used in the statistical prediction of signal behaviour, especially for percentages of time from 0.01 to 99%, taking into account the composite effect of various atmospheric parameters?

7 What procedures can be used to evaluate data quality, accuracy, statistical stability and confidence levels?

8 What methods can be used to perform physical based simulations and forecast propagation conditions during consecutive periods of 24 hours during any season anywhere in the world using numerical weather prediction methods?

9 What methods based on meteorological information can be used in the statistical prediction of signal behaviour, especially extreme events with a long return period?

further decides

1 that the results of the above studies should be included in one or more Recommendations and/or Reports;

2 that the information about radioclimatological parameters should be given in worldwide digital maps with the highest possible accuracy and spatial resolution;

3 that the long-term time variability of radioclimatological parameters should be investigated;

4 that the above studies should be completed by 2019.

Category: S2