QUESTION ITU-R 201-7/3

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

(1966-1970-1974-1978-1982-1990-1995-2000-2007-2012-2016-2019)

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, precipitation, 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 to forecast propagation conditions during any season for periods of time ranging from a few hours to a few daysanywhere 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 2027.

Category: S2