RECOMMENDATION ITU-R RS.1261*, **

FEASIBILITY OF SHARING BETWEEN SPACEBORNE CLOUD RADARS AND OTHER SERVICES IN THE RANGE OF 92-95 GHz

(Question ITU-R 140/7)

(1997)

The ITU Radiocommunication Assembly,

considering

a) that spaceborne cloud radar can determine the vertical profile of clouds and their global distribution;

b) that these parameters are very important for determination of the Earth's radiation budget and thereby predictions of global warming;

c) that measurement of reflectivity from clouds as low as –30 dBZ is necessary;

d) that scattering from clouds at millimeter wavelengths increases approximately as the frequency raised to the fourth power;

e) that worldwide, repetitive measurements of clouds require the use of spaceborne active sensors;

f) that the 92-95 GHz range of frequencies would be suitable to satisfy all requirements, including bandwidth requirements, for spaceborne cloud radars;

g) that Recommendation ITU-R RS.577 establishes requirements for spaceborne cloud radar measurements in this frequency range;

h) that, using available technology, these requirements cannot be satisfied in any frequency band currently allocated for active spaceborne sensors;

j) that Resolution 712 (Rev.WRC-95) of the World Radiocommunication Conference (Geneva, 1995) seeks provision of up to 1 GHz of frequency spectrum around 95 GHz for use by space-based active sensors;

k) that the 92-95 GHz band is allocated to the fixed, mobile, fixed-satellite (FSS) (Earth-to-space) and radio-location services on a co-primary basis;

l) that the 86-92 GHz band is allocated on a co-primary basis to passive services including radioastronomy, Earth exploration-satellite (passive) and space research (passive);

m) that sharing between a spaceborne cloud radar and other services has been studied;

n) that spaceborne cloud radars would produce power flux-densities at the Earth's surface in excess of the power flux-density levels likely to be imposed in frequency bands near 95 GHz allocated to the fixed and mobile services in order to protect fixed and mobile operations;

o) that sharing with the FSS (Earth-to-space) is not feasible due to excessive interference to the spaceborne cloud radar;

p) that the spectrum between 90 and 100 GHz contains many molecular resonances of interest to radio-astronomers;

q) that co-frequency operation by spaceborne cloud radars and radioastronomy observatories could result in disruption to radioastronomy observations with a remote possibility of irreversible damage to the radioastronomy receiver;

r) that current technology limits the use of filters in radioastronomy receivers to reject emissions from spaceborne cloud radars;

---

* This Recommendation should be brought to the attention of Radiocommunication Working Parties 4A, 7D, 8A, 8B and 9D.

** Radiocommunication Study Group 7 made editorial amendments to this Recommendation.

s) that the band 78-79 GHz is suitable for active sensor applications in this region of the spectrum other than for cloud radars;

t) that a bandwidth of 100 MHz is sufficient for use by spaceborne cloud radars;

u) that methods have been identified to mitigate the potential impact to radioastronomy observations,

recommends

1 that spaceborne cloud radars and fixed and mobile services not share common frequency bands;

2 that spaceborne cloud radars and the FSS (Earth-to-space) not share common frequency bands;

3 that sufficient techniques be employed in the spaceborne radar to meet the harmful interference criterion of −222 dB(W/(m^2/Hz)) given in Recommendation ITU-R RA.769 to protect radioastronomy observations in the band 86-92 GHz;

4 that sharing with the radiolocation service in the frequency range of 92-95 GHz is feasible;

5 that technical and operational measures be adopted by the radioastronomy service and active sensor operators to minimize effects on radioastronomy operations;

6 that use of frequencies in the range 92-95 GHz by spaceborne active sensors be limited to spaceborne cloud radars.