The Use by the Radio Astronomy Service of Frequencies Between 275 GHz and 3 THz

Andrew W. Clegg & Tomas E. Gergely
National Science Foundation
Arlington VA 22230

Presently, the international and U.S. tables of frequency allocations extend to 275 GHz. Above this frequency range, there are no allocations; however, there is a footnote to the tables that reference the use of frequencies in the range 275 – 1,000 GHz by passive (non-transmitting) services, including the radio astronomy service. The footnote, which is referenced as No. 5.565, requests that consideration be given to the protection of these passive services when developing future active (transmitting) applications in this frequency region.

The next World Radiocommunication Conference (WRC), presently scheduled for 2011, contains an agenda item that would extend the purview of the footnote to bands up to 3 THz that are of interest to the passive services. The extension of the footnote would be based upon technical studies conducted by working parties of the International Telecommunication Union (ITU), including working parties 7D that deals with radio astronomy and 7C that deals with remote sensing. The agenda item will not result in frequency allocations above 275 GHz, but any future work of the ITU that did consider extensions of the allocation table might leverage the present work being done on extending 5.565.

It is recognized that the atmospheric absorption in the frequency range 275 – 3,000 GHz is very high, and the impact of active services on radio astronomy, particularly at frequencies above 1,000 GHz and at isolated radio observatory sites, is likely to be small. However, the WRC-11 agenda item also covers the use of this frequency range in space, where such absorption considerations do not apply. This agenda item is therefore directly relevant to the protection of submm space-based radio astronomy missions.

The purpose of this presentation is to summarize the work being done in the ITU and in the International Astronomical Union (IAU) in preparation for the WRC-11 agenda item, and to solicit input from the submm radio astronomy community. Because of the long lead time in completing and approving technical documents, and in preparing acceptable strategies for satisfying specific agenda items, it is anticipated that most of the substantive technical work on this agenda item must be completed in the 2009 time frame to be relevant to WRC-11.