

**Author: IEEE Geoscience and Remote Sensing Society**  
**Comments to the proposed revision of the Commission's Rules Regarding**  
**Operation in the 57-64 GHz Band**  
**(ET Docket No. 07-113 RM-11104)**

The Geoscience and Remote Sensing Society (GRSS) of the Institute of Electrical and Electronics Engineers (IEEE) is concerned about the FCC's proposed plans to allow increased EIRP limits in the 57-64 GHz band. Additional information on the GRSS Society is provided in Appendix 1 of this document.

The Society's concern arises from the fact that frequency allocations for the Earth Exploration Satellite Service (Passive) exist from 57-59.3 GHz and therefore fall under the proposed rule. These frequencies are used for atmospheric monitoring in meteorological and climate sensing applications, and are critical for these purposes due to the properties of oxygen absorption and emission in Earth's atmosphere. Currently operational U.S. satellite sensors such as the Advanced Microwave Sounding Unit (AMSU) on one NASA satellite (Aqua) and four NOAA (15-18) satellites and the Special Sensor Microwave Imager Sounder (SSM/I/S) on Department of Defense satellite F-16 make use of this frequency range, and future sensors currently in the planning stages will also utilize these frequencies. Due to the importance of observing small, long-term climatic changes in the Earth's atmosphere, it is very important that even low-level interference in these observations be avoided. ITU-R Recommendation RS.1029-2 "Interference criteria for satellite passive remote sensing" recognizes the importance of the 57-59.3 GHz band for remote sensing, and establishes a threshold power level that should not be exceeded by other applications.

It is often assumed that atmospheric attenuation is so large in this band that long-range reception is not possible. In fact the attenuation of surface-based sources through the entire atmosphere (i.e. the total atmospheric zenith attenuation) is large, but not infinite, as shown in ITU-R Recommendation P.676-7 "Attenuation by atmospheric gases." In particular, attenuation from surface-based sources at higher elevations (for example in Denver, CO, USA at elevation 1.6 km) is reduced by approximately 20 dB compared to the total attenuation from sources at sea level.

The Society believes that a careful examination of the effect of the proposed rule on the EESS (passive) service is necessary to ensure that the rule does not have an adverse impact on EESS applications. The fact that the proposed rule change makes no mention of the presence of EESS (passive) allocations within the band further suggests that a detailed analysis should be performed. The analysis would require information on the expected radiated

power spectral densities and single-source bandwidths to be allowed under the proposed rule, estimates of the expected spatial density of emitters and their elevations, and information on expected sidelobe properties of source antennas. We strongly recommend that the FCC perform such an examination.

Respectfully submitted,

The Geoscience and Remote Sensing Society of the IEEE

**Appendix 1: Description of the IEEE Geoscience and Remote Sensing Society**

The Geoscience and Remote Sensing Society (GRSS) of the Institute of Electrical and Electronics Engineers (IEEE) is one of the 39 technical societies within the IEEE, and has approximately 2600 current members; the society's website is <http://www.grss-ieee.org/>. The IEEE, a non-profit organization, is the world's leading professional association for the advancement of technology, and has more than 350,000 members in over 160 countries.

The fields of interest of the GRSS are the theory, concepts, and techniques of science and engineering as applied to the remote sensing of the earth, oceans, atmosphere, and space, as well as the processing, interpretation and dissemination of this information. Members of GRSS come from both engineering and scientific disciplinary backgrounds. GRSS therefore represents a major international organization of science and engineering professionals in the Earth remote sensing field.

GRSS annually sponsors the International Geoscience and Remote Sensing Symposium (IGARSS), the premier world conference on this topic. This prestigious meeting has become an international focus of remote sensing programs and activities, each year drawing approximately 1400 scientists and engineers from around the world to hear papers and to discuss instruments, techniques, models, and programs of global interest. This past year's agenda can be found at: <http://www.igarss07.org>

The GRSS society maintains five technical committees to organize directed efforts within specific areas. One of these committees, the Frequency Allocation for Remote Sensing (FARS) committee, is chartered to provide technical assessments, guidance, and recommendations for action to the GRSS Administrative Committee (AdCom) and the GRSS membership regarding matters of frequency sharing and interference between remote sensing and other uses of the radio wave spectrum. The FARS committee at present has 51 members representing ten countries.