

Simultaneous Akebono satellite and ground-based observations of MF/HF auroral radio emissions

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MF/HF auroral radio emissions are generated in ionospheric F region altitudes and propagate to the ground and outward to space. At ground level, three types have been identified above 1 MHz: auroral hiss, medium frequency burst (MFB), and auroral roar. Auroral roar-like signals detected in space in a frequency range have been reported by several papers, which were termed terrestrial hectometric radiation (THR) by *Oya et al.* [1985]. We survey long-term observation data obtained by ground-based passive receivers installed in Iceland and Svalbard and the Plasma Waves and Sounder experiment (PWS) mounted on the Akebono satellite to find simultaneous measurements of MF/HF auroral radio emissions above 1 MHz. This data set includes two simultaneous appearance events, during which frequencies of aurora roar and MF burst detected at ground are different from that of Terrestrial Hectometric Radiation (THR) observed by the Akebono satellite passing over the ground-based stations. This frequency difference supports the previously proposed idea that auroral roar and THR are generated at different altitudes across F peak. There is no possibility that simultaneous observations indicate the identical generation region of auroral roar and THR. When the Akebono satellite passing over the ground-based stations detects THR, auroral roar and/or MF burst does not always appear (at 90 percent in this study). This tendency is explained in terms of the idea that the Akebono satellite can detect THR emissions coming from a wider region, and a considerable portion of auroral roar emissions generated in the bottomside F region is absorbed in the D/E regions.