

ULF wave energy transmission from the topside ionosphere to the ground: Modeling and ground-satellite observations

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We develop a model to describe quantitatively the expected amplitude-phase relationships between the ULF wave magnetic components above the ionosphere and on the ground for various ionospheric conditions. The model gives also an estimate of spectral parameters of the Alfvén quasi-resonator (IAR) which plays an important role in the understanding of the physical phenomena occurred in the coupled magnetosphere-ionosphere system. The model incorporates the reconstruction of the vertical profile of all MHD parameters from the IRI-2000 ionospheric model and the numerical solution of the coupled wave equations for Alfvén and compressional modes. This model is applied to the interpretation of Pc1 and Pc3 waves observed simultaneously by low-orbiting satellites (STS5, CHAMP) with high-accuracy magnetometers onboard and by the STEL ground search-coil magnetometers.

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