THE IONOSPHERIC ALFV'EN RESONATOR: COMPARISON OF ANALYTICAL AND NUMERICAL MODELS

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Resonance properties of the ionosphere for Alfven waves are very important for many geophysical phenomena related to the generation and propagation of ULF waves. Extensive studies of the ionosphere as Alfven resonator were performed during last 15 years. In theory, simplified models that allow analytical treatment and fully numerical approaches were developed almost independently. In this paper, we compare analytical formulas and numerical results for Alfven wave reflection coefficient from the ionosphere. This allows us to check the validity of analytical results in the parameter domain where the validity criteria may be violated and other ways of verification (e.g., strict analytical proof) are difficult to use. In particular, the influence of Alfven-wave transformation into the compressional mode on the reflection coefficient is discussed.