

## Uncertainties in the Estimation of the Ionospheric Conductivity

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Various electrodynamical quantities, such as electric field, ionospheric currents and Joule heating rate etc. are utilized in modeling studies of the magnetosphere/thermosphere/ionosphere electrodynamics. The ionospheric conductivity distribution is associated with these quantities directly or indirectly. Considering its importance in the M-T-I coupling study, the accurate determination of the ionospheric conductivity distribution is highly desirable. Unfortunately no attempt to examine systematically the uncertainties involved in estimating the ionospheric conductivity has been made. To provide the community with an idea about the uncertainties involved in the ionospheric conductivity estimation, which is based on the electron density profile obtained from incoherent scatter radars, we examine various sources of the uncertainties. Specifically we examine how temperature influence in determining electron density profile and ion-neutral and electron-neutral collision frequencies, and how the choice of neutral air models affects the conductivity estimation. Also examined is the height range of integration, which affects the height-integrated conductivity, or conductance, especially the lower limit for the Hall conductivity and the upper limit for the Pedersen conductivity.