A Physical Numerical Ionospheric Model and Its Simulation Results

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Abstract: This paper describes the construction of a one-dimensional time-dependent theoretical ionospheric model, which is based on numerical solution of continuity and momentum equations for O^+, O_2^+, N_2^+, and NO^+. The model is designed to have an option to incorporate the observational ionospheric characteristic parameters into the numerical model to indirectly determine the upper boundary condition when solving the transport equations of O^+. A preliminary simulation result of the model when used to simulate the ionosphere during April 18 $\sim$ May 10, 1998, which includes both quiet and disturbed periods, showed that the model constructed is able to reproduce the observational results reasonably well both for quiet and disturbed periods.

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