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# Ions Acceleration and Earthward Injection during Substorm in Magnetotail

**J. K. Shi** (1), T. L. Zhang (2), K.Torkar (2), Z. X. Liu (1)

(1) Center for Space Science and Applied Research, Chinese Academy of Sciences, (2) Space Research Institute, Austrian Academy of Sciences (jkshi@center.cssar.ac.cn / +86-10-62534546)

In this study, we establish a theoretical model to study ion acceleration in magnetotail in substorm. The Vlasov's Equation is used to study spatial and temporal variation of the ion distribution function. Then we research the spatial and temporal variation process of the ion velocities and the ion energies during dipolarization in the substorm in the magnetotail. The main results are as followings. (1) The ion moving presents an earthward injection behavior during the dipolarization. (2) The ions acceleration in perpendicular direction is much more than that in parallel direction, and the ion acceleration is mainly in the middle phase of the depolarization. (3) The higher the ion initial energy, the more the ion energy is obtained. (4) During the dipolarization, the ion energy can reach several hundred of keV. This is consistent with some observation. Therefore, the result in this study seems to support the view of that the storm is consisting of a series of continuous substorms.