Observations of the step-like accelerating processes of cold ions in the reconnection layer at the dayside magnetopause

*Qing-He Zhang[1], Michael Lockwood[2], John C. Foster[3], Qiu-Gang Zong[4], Malcolm W. Dunlop[5], Shun-Rong Zhang[3], Jøran I. Moen[6], Bei-Chen Zhang[7]

1. Shandong Provincial Key Laboratory of Optical Astronomy and Solar-Terrestrial Environment, Institute of Space Sciences, Shandong University, Weihai, China, 2. Department of Meteorology, University of Reading, Earley Gate, Post Office Box 243, RG6 6BB, UK, 3. MIT Haystack Observatory, Westford, MA 01886, USA, 4. School of Earth and Space Sciences, Peking University, Beijing, China, 5. Space Sciences Division, SSTD, Rutherford Appleton Laboratory, Didcot, UK, 6. Department of Physics, University of Oslo, Blindern, Oslo, Norway, 7. SOA Key Laboratory for Polar Science, Polar Research Institute of China, Shanghai, China

Cold ions of plasmaspheric origin have been observed to abundantly appear in the magnetospheric side of the Earth’ s magnetopause. These cold ions could affect the magnetic reconnection processes at the magnetopause by changing the Alfvén velocity and the reconnection rate, while they could also be heated in the reconnection layer during the ongoing reconnections. We report *in situ* observations from a partially crossing of a reconnection layer near the subsolar magnetopause. During this crossing, step-like accelerating processes of the cold ions were clearly observed, suggesting that the inflow cold ions may be separately accelerated by the rotation discontinuity and slow shock inside the reconnection layer.

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