P230-P001 **Room: Poster Session Hall** **Time: May 16**

The energy distribution functions of heavy ions in the vicinity of the Mars : analyses of ASPERA-3/Mars Express data

Atsushi Sakamaki[1]; Yoshifumi Futaana[2]; Shinobu Machida[1]; Stas Barabash ASPERA-3 team[3]

[1] Dept. of Geophys., Kyoto Univ.; [2] IRF; [3] -

Because of the lack of the intrinsic magnetic field, the solar wind interaction with Mars is quite different from that from the Earth. One of the most different issues is that the high flux escaping O+ ions, which is induced by direct energy input of the solar wind, have been observed in the vicinity of Mars. The O+ escape is directly related to the issue of the evolution of water at Mars. Before the arrival of Mars Express spacecraft (MEX), the Phobos-2 was the latest spacecraft which acquired data of hot ions near Mars. From the Phobos-2 data, the ion-pickup acceleration and beam acceleration of O+ ions were found in the nightside of the Mars[Ludin et al., 1991]. However, detailed characteristics and phisycal mechanisms of O+ acceleration are not known.

The MEX carries the Analyser of Space Plasma and EneRgetic Atoms (ASPERA-3) to observe the Martian plasma and energetic neutral atoms environment. ASPERA-3 comprises four sensors, the neutral particle imager, the neutral particle detecter, the electron spectrometer, and the Ion Mass Analyser (IMA) for measuring hot ions. The IMA measures ions with the energy range from 0.1 to 30 keV/q with mass par charge resolutions of 1,2,4,8,16, and more than 20. The total field of view is 90x360 with angular resolution of ˜5.6x22.5. The time resolution for each 3D velocity distribution is about 3 minutes.

In this study, we discuss the characteristics of heavy ions flux in the vicinity of the Mars by analysing the IMA data. We identified 207 events between June and December, 2004 when the IMA detected the flux of heavy ion. By investigatineg the observed energy spectrum of heavy ions qualitatively, we mapped peak energies and counts for observed O+ ions and heavier ions, and found that those characteristics have strong dependence on the location of MEX. This fact implies that the ion acceleration mechanisms also have spatial dependence. Based on these results, we propose a picture of the ion acceleration and the escape mechanisms from Martian upper atmosphere.