Ion Energization and Escape on Mars

E. DUBININ[1]

[1]*Max-Planck-Institut fürSonnensystemforschung, Katlenburg-Lindau, Germany*

Mars does not have a global magnetic field and as a result solar wind interacts directly with its ionosphere and upper atmosphere. Ionospheric ions and neutral atoms ionized by solar UV, charge exchange and electron impact are extracted and scavenged by solar wind providing significant losses of planetary volatiles. There are different channels and routes through which the ionized planetary matter escapes the planet. Escape processes are intimately related with mechanisms of energization of planetary ions. Since forces responsible for ion energization in different channels are different, the effectiveness of escape is also different. Classification of the energization processes and escape channels on Mars and also their variability with solar wind parameters is the main topic of our review. We will distinguish a classical pick and ‘mass-loaded’ pickup processes, energization in boundary layer and plasma sheet, polar wind and enhanced escape flows from localized auroral regions.