Icy Moons Exospheres

Valery I. Shematovich

Institute of Astronomy of the RAS, Russian Federation

The very tenuous exospheres of icy moons are the near-surface (or surface-bounded) atmospheres. Exospheres are produced by the radiolysis of the icy moon surface due to exposure to the solar ultraviolet radiation and energetic magnetospheric plasma ions and electrons. The plasma interaction with the surface is a principal source of O_2, H_2O and the plasma interaction with atmosphere is a principal loss process, therefore a large atmosphere does not accumulate. The DSMC models of the icy moons exospheres will de discussed. Such models are critically important to investigate a very near-surface region (below 10 –50 km). This region could be considered as an extended Knudsen (boundary) layer and is of interest both as an extension to the exosphere of the icy moon surface and as an indicator of surface composition and chemistry. Above the boundary layer both the global and local Monte Carlo models or analytical ones work excellent and could be used as observational constraints and for interpretation of the observational data of the atmosphere-surface interface.