



The ENA albedo of the Martian dayside atmosphere

A. Galli (1), P. Wurz (1), Y. Futaana (2), S. Barabash (2), A. Grigoriev (2), M. Holmström (2)

(1) Physikalisches Institut, University of Bern, Switzerland (galli@space.unibe.ch), (2) Swedish Institute of Space Physics, Kiruna, Sweden.

Observations of the Martian dayside made with the Neutral Particle Detector (NPD) on Mars Express reveal a bright albedo of energetic neutral atoms (ENAs). This ENA albedo originates from solar wind protons and ENAs that precipitate into the neutral atmosphere before being scattered back to space.

The analysis of the ENA albedo is motivated in two ways: First, it allows us to compare the ENA observations to model predictions and test previous model assumptions about the plasma distributions and the dayside atmosphere. Second, the observations can be used to quantify the direct effect of the solar wind on the Martian atmosphere, that is, which fraction of the original particle and energy flux of the unperturbed solar wind is deposited into the atmosphere.

We find that the fraction of solar wind particles (protons and ENAs combined) that penetrate the plasma boundaries is less than 10 % of the solar wind strength outside the bow shock. This confirms that the atmospheric effect of the precipitating solar wind is dwarfed by the solar UV input.