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Energetic Neutral Atoms from the Termination Shock Region

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We present the measurement and analysis of hydrogen energetic neutral atoms (ENAs) recorded with the ASPERA-3 instrument on board Mars Express during the cruise phase and the Mars orbit phase. We conclude that the origin of these ENAs is the inner heliosheath. The ENA energy spectra are all very similar and can be fitted well by a two-component power law. The ENA fluxes, integrated from 0.3 keV to 10 keV, vary in the range of $5 \cdot 10^3$ to $3 \cdot 10^4$ cm^{-2} sr^{-1} s^{-1}. This report is an update of our earlier paper (Galli *et al.*, ApJ 644, 2006, 1317) using updated calibration data and improved instrument knowledge from two years of operation. The present ENA measurements fit together well with earlier ENA data from other spacecraft performed at higher energies, which have their origin also in the inner heliosheath. Comparison of the measured ENA energy spectra with results from several heliospheric models show that some of these models predict significantly lower ENA fluxes at Earth orbit.