

We report observations of neutral atoms from the solar wind in the Earth's vicinity with the Low Energy Neutral Atom (LENA) imager on the IMAGE (Imager for Magnetopause-to-Aurora Global Exploration) spacecraft.

This instrument was specifically designed to be capable of looking at and in the direction of the Sun. Enhancements in the hydrogen count rate in about the solar direction are correlated with neither solar ultraviolet emission nor suprathermal particles and must therefore be due to neutral particles from the solar wind. LENA observes these particles from the direction closest to that of the Sun even when the Sun is not directly in LENA's field of view. Based on simulations, these neutrals are the result of solar wind ions charge exchanging with the exospheric neutral hydrogen atoms in the post-shock flow of the solar wind in the magnetosheath. We consider a variety of sources for the neutral particles observed when the Sun is within LENA's field of view including solar wind charge exchange with dust grains and interstellar neutrals and undisturbed solar wind and magnetosheath charge exchange with the Earth's geocorona. We will compare the LENA results to previous theoretical work and modeling work.