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Direct Detection of Interstellar Neutrals from Earth Orbit

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From December 2000 to early March 2001, the IMAGE Low Energy Neutral Atom (LENA) imager detected a temporally variable signal that had peak count rate in the direction of the velocity vector of the Earth around the Sun. The direction of arrival and the timing of the signal are consistent with interstellar neutrals whose motion through the solar system is altered by the gravitational attraction of the Sun. Energy and mass analysis suggest that interstellar neutral He is responsible for the signal in the instrument. The velocity distribution, mass and energy analysis, and time history of the interstellar neutral signal are reviewed with emphasis on the implications these observations have for the source region outside solar system.