
Observations of Galactic Cosmic Rays in the Very Local Interstellar Medium from Voyager 1

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Abstract

Voyager 1 crossed the heliopause on 25 August 2012 and has been exploring the very local interstellar medium (VLISM) ever since. The Galactic cosmic ray (GCR) energy spectra are for the first time being measured unaffected by solar modulation effects. The initial study of the first ~ 2.5 years of Voyager 1 data from the VLISM (Cummings et al., 2016) provided, among other things, estimates of the energy density of GCRs, their ionization rate of atomic H, and estimates of GCR source abundances. The study also reported the energy spectrum of GCR electrons from 2.7-74 MeV and found that the intensity of electrons below ~ 50 MeV exceeds that of protons. We will update that study using an extended period of nearly five years and new data products that include isotopes of H and He and an extension of the energy range to GeV/nuc energies for some elements. These extended observations help further constrain the propagation parameters of cosmic rays in the Galaxy.

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