

Local interstellar spectra of electrons and positrons by demodulating fluxes from the PAMELA experiment

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On entering the Solar System, galactic cosmic rays undergo solar modulation, which can be described with a modulation parameter defined by proton fluxes from neutron monitors. In particular, the modulation considerably distorts the fluxes of galactic cosmic-ray electrons and positrons with energies below 10 GeV. Taking into account known modulation potential, which also depends on the solar activity, there is a possibility of restoring the local interstellar spectra by demodulating fluxes from satellite experiments.

This work presents primary electron and positron fluxes obtained by the PAMELA experiment at 1 AU for different solar activity phases in 2006–2016 using machine learning methods. Also, by demodulating these spectra, the local interstellar spectra of electrons and positrons have been restored.

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