

On the very local interstellar spectra for galactic Helium-isotopes, deuteron, positrons and antiprotons

Wednesday, 9 June 2021 15:35 (15 minutes)

The very local interstellar spectra (vLIS) for protons and total Helium (He), amongst other galactic cosmic rays (GCRs), were observed in situ by Voyager 1 below about 340 MeV/nuc since it had moved across the heliopause (HP). The latter is considered to be the boundary where the solar modulation (GCRs) commences. Together with high precision PAMELA and AMS observations above 50 GeV at the Earth, we reported previously on new vLIS calculated for protons, total He, other heavier isotopes and also for electrons from 1 MeV to 100 GeV. We now follow up on this procedure to report on the vLIS detached for the isotopes He-4, He-3, and H-2. Combining computations done with the galactic propagation code, GALPROP, and our 3D modulation model for GCRs in the heliosphere, we have computed also vLIS's for positrons and anti-protons. This is done assuming that the essential modulation processes between the HP and the Earth for protons, electrons, He-isotopes, H-2, positrons and anti-protons are essentially similar, except for particle drifts of oppositely charged particles. These new vLIS's will be shown, discussed and evaluated within the context of the total modulation of these GCR particles in the heliosphere over a full solar activity cycle.

Primary author: Prof. POTGIETER, Marius S (IEAP, CA University in Kiel)

Co-authors: Dr BISSCHOFF, Driaan (North-West University, South Africa); Dr ASLAM, OPM (North-West University, South Africa); Dr NGOBENI, Donald (North-West University, South Africa); Dr MIKHAILOV, Vladimir (National Research Nuclear University MEPhI (Moscow Engineering Physics Institute)); Dr BOEZIO, Mirko (INFN, Trieste); Dr RICCARDO, Munini (INFN, Trieste)

Presenter: Prof. POTGIETER, Marius S (IEAP, CA University in Kiel)

Session Classification: Cosmo- and geophysical aspects of cosmic rays

Track Classification: Cosmo- and geophysical aspects of cosmic rays