Contribution ID: **59** Type: **not specified**

Inference of the Local Interstellar Spectra of Cosmic-Ray Nuclei Z ≤ 28 with the GALPROP–HELMOD Framework: Prediction Capability and Hints of Excesses

Wednesday, 7 September 2022 15:40 (20 minutes)

Since its launch, the Alpha Magnetic Spectrometer-02 (AMS-02) has delivered outstanding quality measurements of the spectra of cosmic-ray (CR) species (p^-, e±) and nuclei (H–Si, Fe), which resulted in a number of breakthroughs. Spectra of heavier low-abundance nuclei are not expected until later in the mission. Consequently, we exploited a "fraction"of HEAO-3-C2 data that match available AMS-02 measurements, together with Voyager 1 and ACE-CRIS data, to make predictions for the local interstellar spectra (LIS) of nuclei that are not yet released by AMS-02. The resulting H to Ni LIS, in the energy range from 1 MeV/n to 100÷500 TeV/n, cover 8÷9 orders of magnitude in energy. In this context, some peculiar excesses have been found, hinting at possible primary components. The observed excesses in Li, F, and Al appear to be consistent with the local Wolf-Rayet stars hypothesis, invoked to reproduce anomalous 22Ne/20Ne, 12C/16O, and 58Fe/56Fe ratios in CRs, while excess in primary Fe is likely connected with a past supernovae activity in the solar neighborhood.

Summary

Primary author: MASI, Nicolò (Istituto Nazionale di Fisica Nucleare)

Co-authors: Dr DELLA TORRE, S.; Dr BOSCHINI, M.J.; Prof. GERVASI, M.; Dr GRANDI, D.; Dr JÓHANNESSON, G.; Dr LA VACCA, G.; Prof. MOSKALENKO, I.V.; Dr PENSOTTI, S.; Dr PORTER, T.A.; Dr QUADRANI, L.; Dr RANCOITA, P.G.; Dr ROZZA, D.; Dr TACCONI, M.

Presenter: MASI, Nicolò (Istituto Nazionale di Fisica Nucleare)

Session Classification: Cosmic Rays - 1