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Electron/Positron anisotropy
30 min. invited talk

Transport of electron cosmic rays in the turbulent galactic magnetic fields

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Interstellar Medium (ISM), and Supernovae Remnants (SNRs) are only a few examples of natural habitat of interaction of relativistic particles and magnetic fields, largely mediated by the action of the turbulence. The key science driver concept is the transport in magnetic turbulent fields. A detailed cosmic ray transport description in the Galaxy has been implemented in the DRAGON code, a numerical tool used to simulate the local interstellar spectra (LIS) of cosmic rays. There is by now compelling evidence of an anomalous rise with energy of the cosmic ray positron fraction. Conversely to the standard picture of a pure secondary positron production, the data strengthen the evidence for the presence of two distinct electron and positron spectral components. Given the cosmic ray transport model, I will show that nearby pulsars are viable source candidates of the required e extra-component. In a multichannel analysis of cosmic ray electron and positron spectra, I will present the results of our recent study on the diffuse synchrotron emission of the Galaxy. Comparing the computed synchrotron emission intensity with the radio data, we placed a constraint on the diffusive magnetic halo scale height, of relevant importance especially for indirect Dark Matter searches. Lately, I will discuss the impact of a realistic spiral arm distribution of cosmic rays source in the Galaxy, modeling the e spectra measured by Pamela and AMS-02 by running DRAGON in a full three-dimensional version.