

Fitting electron spectrum from AMS-02 by pulsar-wind nebulae

In this work, we use the latest data of the total flux of cosmic-ray electrons from AMS-02. The AMS-02 data are comprehensive in between a few GeV to TeV. We find a global fit for the electron spectrum. The global fit is a smoothly broken power-law model that is compatible with the observation. We consider a background model for the production of electrons in the Milky Way galaxy. We assume that the pulsar-wind nebulae (PWNe) is a major source of the excess of high-energy electrons. The electrons propagate in a short length, they easily lose their energy during traveling through the interstellar medium (ISM). The loss rate of high-energy electrons that diffuse through ISM from the origin are synchrotron radiation and inverse Compton scattering. We study the nearby pulsars in between the distance 50 –1000 pc from the Australia Telescope National Facility (ATNF) pulsar catalogue to fit the pulsar spectrum by using the Green's function of the propagation of electrons model. Some parameters in the pulsar catalogue are constrained. We use the model that consists of a single pulsar and combined pulsars, e.g. with two and three pulsars. The electrons spectrum fits well with the background model and PWNe. Finally, we adopt the reduced chi-square to find the best-fit of the pulsar model.

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