

Study of the AMS-02 results of cosmic electron/positron spectra and anti-proton fraction

The Alpha Magnetic Spectrometer (AMS-02) has published the unprecedentedly precise measurement of the cosmic electron and positron spectra as well as the positron fraction and anti-proton fraction. We have given a quantitative study on the AMS-02 results by a global fitting to the electron and positron spectra, together with the positron fraction data. The primary electron spectrum and the parameters for pulsars or dark matter that contribute extra positrons are determined simultaneously. We find that there is a hardening of the primary electron spectrum at ~ 60 GeV. With such a new feature at the background spectrum, both the pulsars and dark matter can explain the AMS-02 results very well. The anti-proton fraction measured by AMS-02 is also studied systematically, focusing on the uncertainties of secondary anti-proton prediction from cosmic rays propagation and hadronic interaction.

Summary

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