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Antiprotons and Elementary Particles over a Solar Cycle: Results from the Alpha Magnetic Spectrometer

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We present results over an 11-year Solar cycle of cosmic antiprotons in the rigidity range from 1.00 to 41.9 GV. The antiproton fluxes exhibit distinct properties. Compared with other cosmic elementary particle fluxes (proton, electron, and positron), the magnitude of the antiproton flux temporal variation is significantly smaller. A hysteresis between the antiproton fluxes and the proton fluxes is observed, whereas the antiproton and electron fluxes show a linear correlation. With a model-independent analysis, we found a universal relation between the shape of the rigidity spectrum and the magnitude of flux temporal variation over an 11-year Solar cycle for both positively and negatively charged particles. The simultaneous results on antiproton, proton, electron and positron provide unique information for understanding particle transport in the Solar System as a function of mass, charge, and spectral shape.

Collaboration you are representing

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