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Antiproton Flux and Properties of Elementary Particle Fluxes in Primary Cosmic Rays Measured with the Alpha Magnetic Spectrometer on the ISS

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Latest results by AMS on the fluxes and flux ratios of charged elementary particles in the absolute rigidity range from 1 up to 2000 GV reveal unique properties of cosmic charged elementary particles. In the absolute rigidity range ~60 to ~500 GV, the antiproton flux and proton flux have nearly identical rigidity dependence. This behavior indicates an excess of high energy antiprotons compared with secondary antiprotons produced from the collision of cosmic rays. More importantly, from ~60 to ~500 GV the antiproton flux and positron flux show identical rigidity dependence. The positron-to-antiproton flux ratio is independent of energy and its value is determined to be a factor of 2 with percent accuracy. This unexpected observation indicates a common origin of high energy antiprotons and positrons in the cosmos.

Primary author: Dr TANG, Zhicheng (Institute of High Energy Physics, Chinese Academy of Sciences)

Co-authors: Dr CHOU, Hsin-Yi (Institute of Physics, Academia Sinica, Taiwan); Dr WENG, Zhili (Massachusetts Institute of Technology)

Presenter: Dr TANG, Zhicheng (Institute of High Energy Physics, Chinese Academy of Sciences)

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