

# Towards Understanding the Origin of Cosmic-Ray Positrons

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Precision measurements of cosmic ray positrons are presented up to 1 TeV based on 1.9 million positrons collected by the Alpha Magnetic Spectrometer on the International Space Station. The positron flux exhibits complex energy dependence. Its distinctive properties are: (a) a significant excess starting from 25.2 GeV compared to the lower-energy, power-law trend; (b) a sharp drop-off above 284 GeV; (c) in the entire energy range the positron flux is well described by the sum of a term associated with the positrons produced in the collision of cosmic rays, which dominates at low energies, and a new source term of positrons, which dominates at high energies; and (d) a finite energy cutoff of the source term at 810 GeV is established with a significance of more than  $4\sigma$ . These experimental data on cosmic ray positrons show that, at high energies, they predominantly originate either from dark matter annihilation or from new astrophysical sources.

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