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Properties of Elementary Particle Flux Ratios in Primary Cosmic Rays

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We report the measurements of the fluxes of elementary particles: electrons, positrons, protons, and antiprotons, in the cosmic rays by the AMS experiment. The measured spectra show distinctive features that cannot be explained by ordinary cosmic ray models. In particular, in spite of the different production and propagation properties of protons, antiprotons and positrons, the antiproton-to-proton and positron-to-proton flux ratios are rigidity independent above 60 GV, while the electron flux shows completely different rigidity dependence. To explain these unexpected features, new understandings of elementary particles in the cosmic rays are needed.

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