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The BESS-Polar II lower-energy antiproton flux using the upper-middle TOF trigger mode

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To observe cosmic-origin antiparticles, it is crucial to mitigate the astrophysical background. One approach involved searching for background-free antideuterons/antihelium; however, no viable candidates were identified. Consequently, we extended our antiproton observations to the lower-energy region below 0.2 GeV, where the contribution from secondary particles is minimized, and explored the potential signatures of dark matter in the 4.7×10^9 cosmic ray events recorded by BESS-Polar II during the solar activity minimum in 2007. We modified the trigger conditions to utilize the middle time-of-flight (TOF), effectively reducing the amount of passing material by half. Additionally, we developed a multi-track analysis method to identify annihilated antiprotons, which are expected to produce backward tracks. We will report the details of the analysis and the lower-energy antiproton flux measured by BESS-Polar II.

Collaboration(s)

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