

Selection of low-energy antiprotons stopped in coordinate-sensitive calorimeter of PAMELA spectrometer

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Experimental measurements of the antiproton flux in the near Earth space are important for astrophysics, including the exploration of the hypothetical “dark” matter particle properties. From June 2006 up to January 2016, the scientific experiment PAMELA on board the spacecraft Resurs-DK1 was carrying out the study the various cosmic rays components in the wide energy range. PAMELA spectrometer allows registering low-energy antiprotons ($E < 1$ GeV) by two different detectors independently: the magnetic spectrometer and the coordinate-sensitive electromagnetic calorimeter. This paper presents a method of antiproton’s identification, stopping in the calorimeter. It based on the analysis of the topology of antiproton and a secondary charged meson tracks which arising in the annihilation process. The application of this method will independently confirm the results of the magnetic analysis, and increase of statistics due to a greater geometric factor of calorimeter in comparison with the magnetic spectrometer is expected.

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