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In-flight second order correction of PAMELA calorimeter characteristics (for simulation in Geant4)

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Simulation of the PAMELA spectrometer characteristics is performed now by Geant4 software package (in the PAMELA collaboration), which needs a detailed information about geometry, materials etc. of scientific equipment. This data is taken from manufactures or obtained from different ground-based tests including accelerators.

But the characteristics may change a bit during a launch or a long time of operation on the orbit. We propose a method of in-flight correction of calorimeter characteristics. To calculate them we select relativistic particles passing through the calorimeter without interactions and low-energy particles stopping inside it (Bragg curves or stopping power). We obtain correction values from a comparison of various measurements between experimental data and simulation in assumption that electromagnetic processes are performed in Geant4 with high precision.

As a result, characteristics of silicon sensors and tungsten absorber of calorimeter are refined. Correction values are within $\approx 5\%$ of the original values.

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