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The cross section of the inelastic interaction of protons and helium nuclei with the tungsten obtained with the PAMELA space experiment

We present the energy dependence of the cross section for the inelastic interaction of protons and helium nuclei with the tungsten in the energy range from a few hundred MeV to a hundred GeV using the data of the PAMELA space experiment. It was intended for the precision measurements of the cosmic ray fluxes of different nature and include a set of detectors for the reliable determination of the particle characteristics (their type and energy). Identification of particles was carried out with the tracker system in magnetic field, time-of-flight and anticoincidence systems. A coordinate-sensitive calorimeter with a tungsten absorber, in turn, allows us to study the topology of the interaction of particles inside it, and calculate the cross-section of their inelastic interaction. We present the comparison of the obtained results with the measurements at accelerators and with existing theoretical models. The results of the work can be demanded for the development of numerical models describing particle's interactions.

Author: GOLUB, Olga (NRNU MEPhI)

Co-author: Mr MAYOROV, Andrey (NRNU MEPhI)

Presenter: GOLUB, Olga (NRNU MEPhI)

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