

SIMULATION OF THE GEOMAGNETIC CUT-OFF WITH GEANT USING THE INTERNATIONAL GEOMAGNETIC REFERENCE FIELD

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The International Geomagnetic Reference Field is used in a GEANT 3 simulation to calculate the geomagnetic cut-off for cosmic rays entering in the Earth's magnetic field. The calculations are done in the back tracking method, where antiprotons start from the top of atmosphere and are tracked to outer space. The geomagnetic cut-off functions are estimated in momentum steps of 0.2 GeV for 131 directions in 1655 locations covering in a nearly equidistant grid the surface of the Earth. For special locations, where neutrino or low energy muon data have been measured, the cut-off functions are calculated in a fine grid of 21601 directions. The estimated geomagnetic cut-offs can be verified by the experimental results for primary protons and helium nuclei measured in different geomagnetic latitudes during the shuttle mission of the AMS prototype. These precise tables of the geomagnetic cut-off can be used in the frame of the CORSIKA code to calculate atmospheric muon and neutrino fluxes.