

STUDY OF PRIMARY PROTONS AND ALPHA PARTICLES AT 10-100 TEV/N BY EAS-TOP AND MACRO

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The primary proton and alpha particle spectra in the energy range 10-100 TeV/n have been studied at the Gran Sasso Laboratories by means of the combination of the high energy muons detected by MACRO deep underground, and the EAS-TOP Cherenkov light array at the surface. The MACRO detector provides the measurement of the threshold energy/nucleon of the primary ($E_o/A > 1.3$ TeV), and of the shower geometry (arrival angle and core location); the Cherenkov light detector performs a measurement directly related to the total primary energy. The experimental data are compared with the existing direct measurements of the proton and alpha particle fluxes.