Apparent Cutoff Rigidities for Cosmic Ray Latitude Survey from Antarctica to Italy in Minimum of Solar Activity

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In this paper we calculate the apparent cut-off rigidities for the backward route (Antarctica-Italy) of the cosmic ray (CR) latitude survey performed on a ship during 1996-97 solar minimum. Computations were done on the basis of results of Danilova et al. (elsewhere in this conference) on trajectory calculations for inclined cut-off rigidities for various azimuth and zenith angles (0˚, 15˚, 30˚, 45˚, 60˚) and azimuth directions changing from 0˚ to 360˚ in steps of 45˚. The information on integral multiplicities of secondary neutrons detected by neutron monitor in dependence of zenith angle of incoming primary cosmic ray particles have been also used. This information is based on the theoretical calculations of meson-nuclear cascades of primary protons with different rigidities arriving to the Earth's atmosphere at zenith angles 0˚, 15˚, 30˚, 45˚, 60˚ and 75˚ (Dorman and Pakhomov, 1979). The results of Dorman and Pakhomov (1979) have been checked and normalized by using the coupling functions obtained by Dorman et al. (2000). Results are compared with the apparent cut-off rigidities obtained by Clem et al. (1997) and computed by Dorman et al. (2000) by using dipole approximation for inclined directions. The difference between the computed apparent and vertical effective threshold rigidities reaches $\sim$1 GV at $R > 7$–8 GV. At rigidities of 10–16 GV, the difference between the apparent and effective vertical threshold rigidities is larger than that obtained in [Clem *et al*., 1997] and in [Dorman *et al*., 2000] by factors of 1.1–1.3 and 1.6–1.8, respectively.