RADIAL VARIATION OF ENERGY SPECTRA OF LOW-FLUX MEV PROTONS ABOARD HELIOS IN 1975-77

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Pulse height data from the Univ. Kiel energetic particle telescopes aboard Helios 1 and 2 obtained during very low-flux quiet activity periods are analysed by using a statistical background reduction method. The energy spectra of protons in the energy range of 4-27 MeV near the spectral minimum exhibit systematic radial variation. The slope below about 10 MeV is smallest near 0.6 AU, whereas the spectrum becomes softer both nearer the Sun and closer to 1 AU. The results are compared with simultaneous IMP-8 data at the solar activity minimum of 1976-77 and SOHO measurements in 1996-97, respectively. The analysis allows determining the radial gradient of the low-flux population as well as comparing the absolute fluxes at the two minima thus providing information about the origin of the particles.