

PROPOSED LOCAL INTERSTELLAR SPECTRA FOR COSMIC RAY ELECTRONS

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Galactic propagation models for cosmic ray electrons give a synchrotron spectral index larger than the recently determined radio index between 22 - 408 MHz in the direction of the galactic disk (Roger et al., 1999), and smaller than the radio index between 0.5 - 2000 MHz in the direction of the galactic poles (Peterson et al., 1999). Diffuse gamma-ray data appear to be 'contaminated' by Crab-like point sources, so that it is difficult to derive a consistent local interstellar spectrum (IS) for electrons in the 1 to 30 MeV range. Using a phenomenological approach, we introduce two adjusted IS, such that the model radio spectral index agrees with observations of the galactic disk- and polar approaches above and below 20 MHz. By adding the constraints expected from the heliospheric modulation of galactic electrons, we find that the IS obtained by the 'galactic disk approach' is marginally above the lower limit for a local IS set by Pioneer 10 electron data at ~4 MeV and ~16 MeV observed in the outer heliosphere. The 'polar approach' gives an IS which can be considered a reasonable local IS for cosmic ray electrons.