

SPECTRAL INDICES OF RADIO LOOPS

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Abstract. Observations of the continuum radio emission at 1420, 820 and 408 MHz enabled estimations of the brightness of the radio loops. We calculated the mean brightness temperatures and surface brightnesses of the six main Galactic radio-continuum loops I-VI at the three frequencies. We have demonstrated the reality of Loops V and VI and present diagrams of their spectra for the first time. We derived the radio spectral indices of Galactic radio loops from radio surveys at three frequencies. The method we have developed for large radio loops, we used also for smaller ones. In this paper we also estimated the temperatures and brightnesses of the Monoceros radio loop at 1420, 820 and 408 MHz and of Cygnus loop. The spectra (mean temperature versus frequency) between the three frequencies, as well as the TT graphs, are estimated and the spectral indices are also obtained. Using the supernova remnant (SNR) hypothesis for the origin of radio loops, distances are calculated from the surface brightnesses and the angular diameters. The obtained results confirm non-thermal origin of the radio loops and we show that our method is applicable to almost all SNRs.