Study of radio spectral index of radio galaxy DA 240

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Here we investigate the giant radio galaxy DA 240, which is a FRII source. It is an example of Double Radio source Associated with Galactic Nucleus (DRAGN) (see Leahy 1993). DA 240 was among the first giant radio galaxies to be recognized as such, and a study of its environment can be found in Peng et al. 2004. It consists of two radio clouds about 40' long, and a comparatively weak central core (Artyukh & Ogannisyan 1988).

Specifically, we investigate its flux density, as well as the spectral index distribution. For that purpose, we used publicly available data for the source: Leahy's atlas of double radio-sources (Laing, Riley & Longair 1983 and Leahy, Bridle & Strom 2013) and NASA/IPAC Extragalactic Database (NED) (Mazzarella and the NED Team 2002). We use observations at 326 MHz (92 cm) and at 608 MHz (49.3 cm).

We obtained spectral index distributions between 326 and 608 MHz. For the first time we give spectral index map for these frequencies. We found that the synchrotron radiation is the dominant radiation mechanism over most of the area of DA 240, and also investigated the mechanism of radiation at some characteristic points, namely its core and the hotspots. The results of this study will be helpful for understanding the evolutionary process of the DA 240 radio source.

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