



Contribution ID: 120

Type: **not specified**

Miscellaneous radio galaxies from LOFAR survey

Our work aims to identify the miscellaneous radio galaxies (MRGs) using the LOFAR Two-meter Sky Survey First Data Release (LoTSS DR1) at 144 MHz. The miscellaneous radio sources are very rare because of their peculiar morphological radio structure, which does not match with the known classes of radio sources. We find only four such MRGs by manually examining 18,500 samples. The peculiar morphology is not found in other radio frequencies 1400, 150, and 325 MHz. We estimate different physical parameters like spectral index, radio luminosity, and radio power of these sources. Among the four MRGs, J1428+4556 has the highest linear size of 3.972 Mpc and can be considered a giant radio galaxy. We also try to present the known galaxy cluster association with these MRGs. We find that the MRGs are associated with at least one galaxy cluster within 1 Mpc radius. The basic parameters such as mass, radius, and richness of the clusters are also noted.

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