Exploring the faint source population at 15.7 GHz

Imogen Whittam[1], Julia Riley[2], Dave Green[2], Matt Jarvis[1,3]

[1] *Physics Department, University of the Western Cape, Private Bag X17, Bellville 7535, South Africa*
[2] *Astrophysics Group, Cavendish Laboratory, 19 J. J. Thomson Avenue, Cambridge CB3 0HE*
[3] *Astrophysics, University of Oxford, Denys Wilkinson Building, Keble Road, Oxford, OX1 3RH, UK*

Abstract

We investigate the properties of the faint source population at 15.7 GHz, a previously unexplored parameter space. A complete sample of sources with flux densities > 0.5 mJy is selected from the Tenth Cambridge (10C) survey in the Lockman Hole and matched to a range of multi-wavelength data. We find that essentially all (> 97 percent) of the 10C sources are radio galaxies; the populations of starforming galaxies and radio-quiet AGN predicted to be present by recent models, such as the SKADS Simulated Skies, are not found in the 10C sample. The radio galaxies are split into high-excitation and low-excitation radio galaxies (HERGs and LERGs), and we find that the HERGs tend to have flatter spectra, smaller linear sizes, higher flux densities and be at larger redshifts than the LERGs. We use new observations to extend this study to fainter flux densities, and find that the faint, high-frequency sky continues to be dominated by radio galaxies down to 0.1 mJy.