



Contribution ID: 46

Type: **not specified**

Spectral analysis of spatially-resolved 3C295(sub-arcsecond resolution) with the International LOFAR Telescope

Thursday, 7 October 2021 17:20 (20 minutes)

3C295 is a bright, compact steep spectrum source with a well-studied integrated radio spectral energy distribution (SED) from 132 MHz to 15 GHz.

However, spatially resolved spectral studies have been limited due to a lack of high resolution images at low radio frequencies.

These frequencies are crucial for measuring absorption processes, and anchoring the overall spectral modelling of the radio SED. In this paper, we use International LOFAR (Low-Frequency ARray) Telescope (ILT) observations of 3C295 to study its spatially resolved spectral properties with sub-arcsecond resolution at 132 MHz.

Combining our new 132 MHz observation with archival data at 1.6 GHz, 4.8 GHz, and 15 GHz, we are able to carry out a resolved radio spectral analysis. The spectral properties of the hotspots provides evidence for low frequency flattening. In contrast, the spectral shape across the lobes is consistent with a JP spectral ageing model.

Using the integrated spectral information for each component, we then fit low-frequency absorption models to the hotspots, finding that both free-free absorption and synchrotron self-absorption models provide a better fit to the data than a standard power law.

Although we can say there is low-frequency absorption present in the hotspots of 3C295, future observations with the Low Band Antenna of the ILT at 55 MHz may allow us to distinguish the type of absorption.

Research area

Extragalactic Continuum (galaxies/AGN, galaxy clusters)

Primary author: BONNASSIEUX, Etienne (Istituto Nazionale di Astrofisica (INAF))

Presenter: BONNASSIEUX, Etienne (Istituto Nazionale di Astrofisica (INAF))

Session Classification: Galaxy Evolution and AGN