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In-band spectral index techniques for extended radio sources

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Spectral indices are an effective technique for differentiating between thermal and non-thermal sources of radio emission. Most often, spectral indices are determined using flux measurements taken from multiple observations with different instruments. Since this data is not always available, finding indices from a single telescope observation is desirable. The reliability of these in-band spectral indices has not been well studied, particularly for extended sources. I will discuss three different techniques for finding in-band spectral indices using EMU (Evolutionary Map of the Universe) data from ASKAP (the Australian Square Kilometre Array Pathfinder). These techniques include: integrating fluxes in sub-bands, temperature-temperature plots, and utilizing the Taylor terms produced in the imaging process. I apply these techniques to a selection of extended sources of radio emission, primarily supernova remnants (SNRs) and HII regions, and assess if the indices produced by the different techniques agree with the expected values. I examine how well the in-band techniques can differentiate between the thermal (HII regions) and non-thermal (SNRs) source.

Did you give a contributed talk at CASCA 2026?

No

If you are selected for a poster, would you be interested in giving a short flash talk on your work?

No

What is your career level?

PhD

Which keyword describes the area of focus of this talk?

Instrumentation

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