Contribution ID: **114** Type: **Poster**

Detection of Circular Features using the Hough Transform

Monday 7 July 2025 12:51 (1 minute)

Astronomical images can reveal circular structures arising from various phenomena. For instance, a shock propagating through the interstellar medium can sweep up material, creating voids, while relativistic electrons within shock and magnetic fields generate synchrotron radiation across the radio to X-ray bands. Commonly, these circular features are identified through a mostly manual inspection process; however, the high resolution of modern telescopes and large coverage of state-of-the-art surveys have rendered this approach unviable and impractical. The Hough Transform has previously demonstrated success at detecting circular features in radio images of supernova remnants. However, this application has been limited to individual images of these objects, requiring only a very simplified approach. Here, we explore the application to survey data containing a multitude of potential circular features and an extension of the method to three-dimensional data cubes.
In this contribution, we will introduce a method to identify circular features based on the Hough transform, discuss its challenges and present our extension of the method to apply it to data cubes. We will also present results obtained from applying it to different observations, such as from the Mopra Southern Galactic Plane Carbon Monoxide Survey.

Author: MCLEOD, Georgia (The University of Adelaide)

Presenter: MCLEOD, Georgia (The University of Adelaide)

Session Classification: Poster