Contribution ID: **17**   Type: **Oral**

Development of radio source detection and classification tools for SKA precursors

Friday, 16 June 2023 09:20 (15 minutes)

The SKA precursor communities are currently developing new software to automate the processing of radio images for various tasks, including source extraction, object or morphology classification, and anomaly detection. These developments heavily rely on HPC processing paradigms and machine learning (ML) methodologies.

In this context, we are developing several tools to support the scientific analysis conducted within SKA precursor surveys. One of them, dubbed *caesar*, is a source finder for large radio-continuum maps, capable of distributing processing across multiple computing nodes in an HPC infrastructure. Another tool, *caesar-mrcnn*, employs trained deep neural networks to detect imaging artefacts and radio sources of different morphologies. *sclassifier* offers various ML methods for different applications, such as source classification from multi-wavelength images, or unsupervised/self-supervised learning of radio data representations. Furthermore, we are developing tools that use generative models to produce synthetic radio image data for data challenge or model performance boosting scopes. These tools have been trained and tested on ASKAP EMU and MeerKAT GPS survey data.

An overview of the achieved results will be presented at the workshop, along with details on the employed computing resources, ongoing activities, and future prospects.

Primary author: Dr RIGGI, Simone (Istituto Nazionale di Astrofisica (INAF))

Presenter: Dr RIGGI, Simone (Istituto Nazionale di Astrofisica (INAF))

Session Classification: Radio Astronomy

Track Classification: Radio Astronomy