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The SKA precursor view of Galactic extended sources

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Deep radio continuum surveys are an essential tool for the study of the different populations of Galactic radio-emitting objects. So far, however, statistical studies of these families are severely affected by selection effects due to the limited capabilities of existing surveys, which undermine the detection of the shallowest and most extended sources. This observational bias results in an underestimation of the studied populations with respect to the theoretical predictions.

In this context, ASKAP and MeerKAT, thanks to their high sensitivity, resolution and uv-coverage, come to fill this gap. These instruments are capable of producing complete censuses of Galactic radio-emitting objects, allowing for their detailed characterization, and revolutionizing stellar astrophysics.

In this talk, we will present the results obtained with data from the MeerKAT SARAO Galactic Plane Survey and the ASKAP Evolutionary Map of the Universe. We will introduce a statistical analysis of the more than 15k extended sources detected in the MeerKAT tiles (l=2-60°, 252-358°, b=+-1.5°). We will discuss the implications for the study of Galactic HII regions, evolved stars and supernova remnants, as well as for the identification of unknown sources. Then, we will focus on the study of Galactic SNRs, which are among the most extended sources in the Galactic plane. We will show some interesting cases found in a sample of 28 known SNRs, for which we could produce integrated and spatially resolved spectra combining SGPS and MWA data, providing deeper insights into their morphology and physics. Finally, we will present new SNRs from the ASKAP EMU survey, highlighting the potential of SKA precursors for the discovery of candidate objects.

keywords

MilkyWay, Supernova remnants, MeerKAT, ASKAP

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