

Wide-band multi-scale images of the Galactic Plane at low radio frequencies

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The Murchison Widefield Array is a radio interferometer that, over the years, has operated in different configurations observing the sky with a wide frequency band (72–300 MHz). Phase I observed using an abundance of short baselines to resolve large scale structures ($2' - 15''$) reaching a noise level of 50–100 mJy/beam along the Galactic plane. Phase II, doubling the length of the baselines was able to capture the fine details of the smaller scales ($45'' - 20'$) with \sim mJy/beam noise levels due to the lower confusion limit over long integration times.

The joint deconvolution of these two surveys, performed using a GPU-based Image Domain Gridding (IDG) extension of WSCLEAN, enables to obtain an image of the sky with a synergistic combination of resolution and sensitivity to all spatial scales. We imaged the Galactic plane within $340^\circ < l < 260^\circ$ and $|b| < 10^\circ$ with an RMS noise varying from 10 to 2 mJy/beam across the observing band, and we are currently working on the region of the Galactic centre.

In this talk I will provide you an overview of the methodology applied to create the images, and I will show some results along with a summary of the science topics we can carry out with these data, such as the consequences of free-free absorption at low radio frequencies.

keywords

survey, galactic plane, imaging

In-person or online?

online

Career level

Student

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