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Enhanced Imaging With e-MERLIN

Thursday, 9 May 2024 15:30 (15 minutes)

This presentation seeks to illustrate recent (and ongoing) e-MERLIN enhancements in imaging capabilities which are starting to be delivered from a combination of continued software developments and a funded programme of digital upgrades to the existing e-MERLIN hardware.

These enhancements are being rolled out and the presentation will illustrate how e-MERGE L-Band data taken between 2014 and 2016 will finally be fully imaged across the full field of view of the 25m diameter antennas including the 32m Cambridge dish together with the 76m diameter Lovell telescope by the incorporation of detailed beam models. With the addition of uv-averaging to the imaging step, all the many TB of (substantially interference-free) historical data can then be incorporated into a single sub-μJy sensitivity image.

The last few e-MERGE C-Band datasets are finally being observed –again with the full range of e-MERLIN antenna sizes and with dual C-Band frequencies centred at 4.75GHz and 6.25GHz (for enhanced uv-coverage) over a 7-point mosaic covering the central 10 arcminute diameter of the L-Band field. Again, imaging developments utilised in the L-Band imaging will be extended to the more complex C-Band imaging.

Enhanced e-MERLIN + Western EVN imaging of M82 SNR will be shown to illustrate enhanced resolution imaging intermediate between e-MERLIN and full EVN resolution, matched to the study of recent (less than a few hundred years old) supernova remnants in the nuclear region of M82 which are very heavily resolved at full EVN resolution. The digital upgrade will ultimately allow increased bandwidth of e-MERLIN observations with the EVN which will improve the sensitivity of the combination imaging.

The digital upgrade will ultimately allow the existing (and aging) WIDAR correlator to be replaced by a software correlator which can be scaled for increased observing bandwidths in the future.

keywords

Imaging, galaxies

In-person or online?

in-person

Career level

Mid-Senior

Primary author: Dr MUXLOW, Tom (Jodrell Bank Centre for Astrophysics)

Presenter: Dr MUXLOW, Tom (Jodrell Bank Centre for Astrophysics)

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