e-MERLIN

The University of Manchester
Jodrell Bank Observatory

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e-MERGE Survey (e-MERLIN+JVLA) mas imaging of the μJy radio source population

Tier 0: Normal galaxies out to z ~ 5 (180hrs observations @1.2-1.7GHz) - *Deep imaging around clusters to utilise amplification by lensing*

Tier 1: *Deep high resolution imaging of the μJy radio sources in GOODS-N* e-MERGE: ≤200mas resolution over ~0.2 deg2 –> ~5000 galaxies

Tier 2: Shallow-wide survey over ~2.0 sq-deg – Piggyback on SuperCLASS Legacy Survey

Tier 1:
Detailed investigation of SF activity / AGN feedback
L-Band imaging of 30' field (200mas)
C-Band mosaic of the inner 12' field (35mas)
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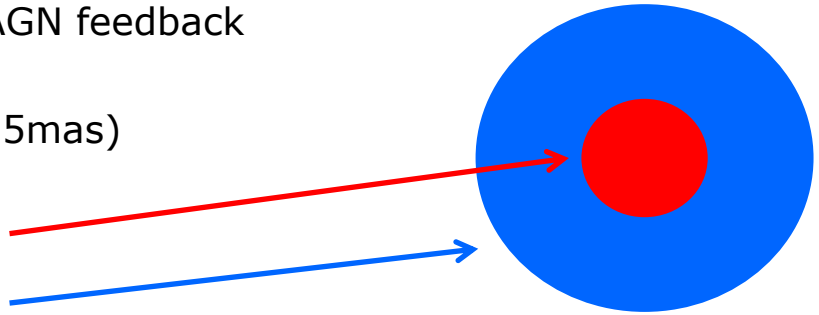
L-Band – Central 15' *1σ ~500nJy/bm*
Outer 30' annulus 1σ ~1μJy/bm



In full 30' field ~1500 AGN and ~3100 S-F galaxies complete to local ~6σ

Huge wide-field imaging exercise requiring >1TB RAM to process
Large data-sets >>20TB of raw data

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e-MERGE DR-2 on IRIS..

Current DR-1 (inner 12arcmin) field imaging requires ~700-800GB of memory to image efficiently using current widefield imaging techniques

DR-2 imaging will cover a field of ~30arcmin and requires >1TB memory
Similar very wide-field imaging to be applied to all data

New 'fat-note' IRIS compute resource for e-MERLIN & ALMA providing large memory is enhanced science delivery – test imaging underway on locally installed IRIS resource.

High memory nodes split between local (very easy access) and grid.
- Large Memory requirement (>1TB) for imaging.

Easy access route is important especially for interactive work on data

Resources are currently utilised for specific e-MERLIN & ALMA programmes before wider opening to e-MERLIN and ALMA communities

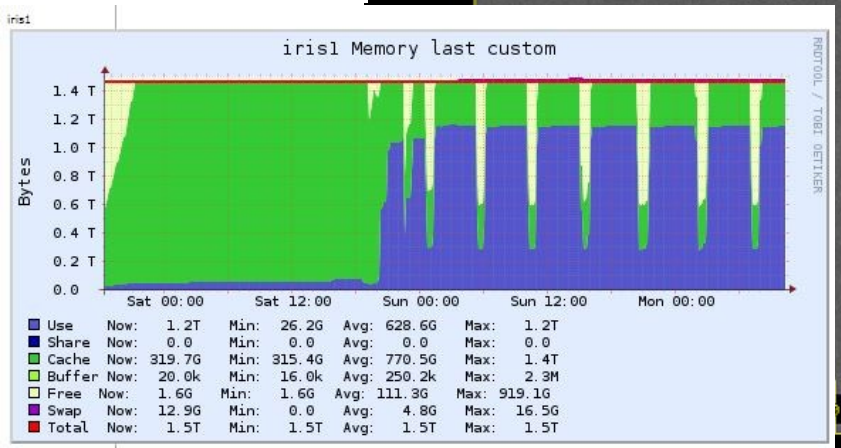
eMERGE DR2 testing imaging

Initial uncleaned image **30'x30'**
45,000pix on a side

Data from DR-1 weighted naturally

2 peeled sources present
Field rms ~1.7μJy/bm

Deconvolution still running – utilising ~1.2TB of RAM



30arcmin^2 'dirty' image - Ongoing
Using IRIS nodes installed locally at JBCA for quick access

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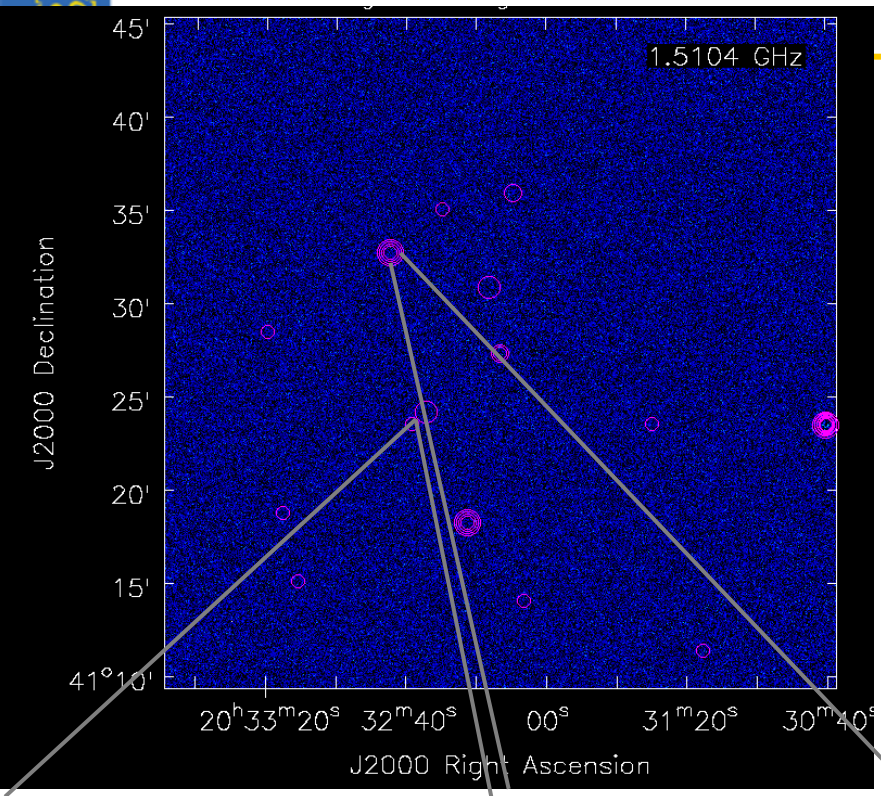
Other test fields



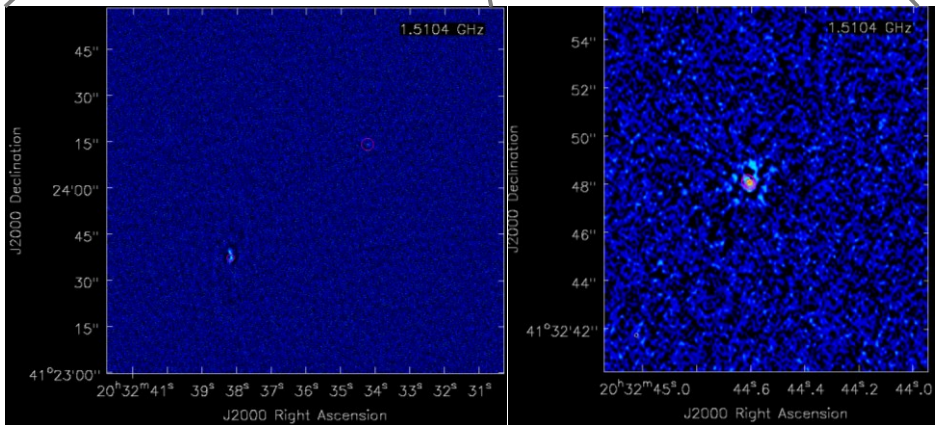
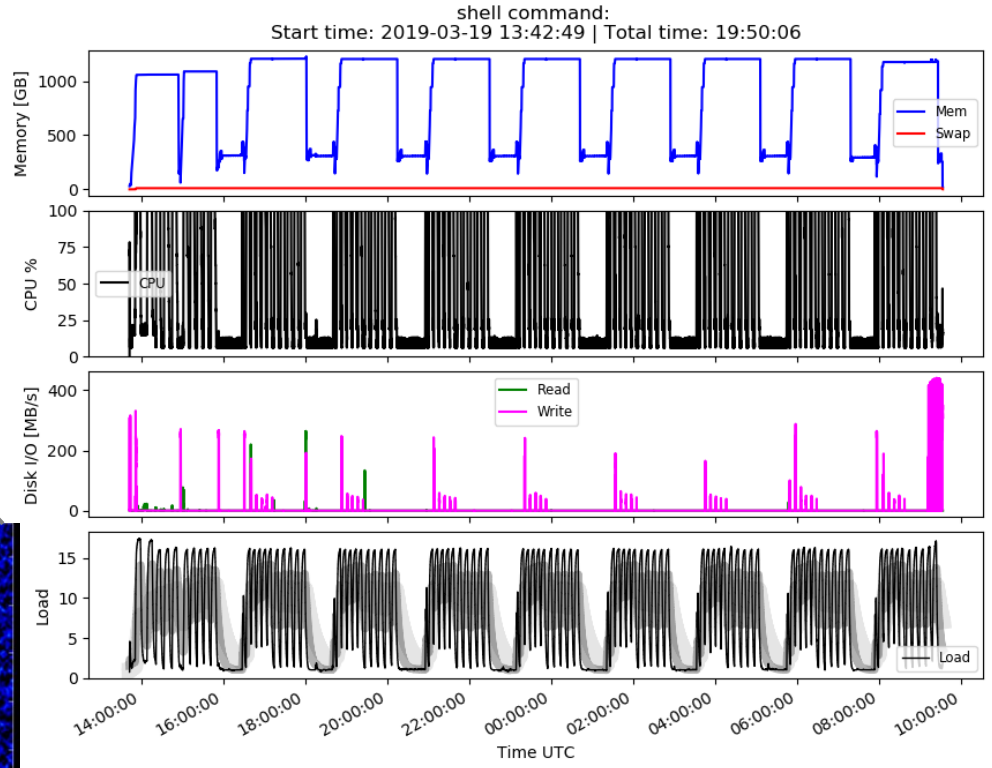



Image rms 10μJy – Full field imaging, 1.2TB memory usage