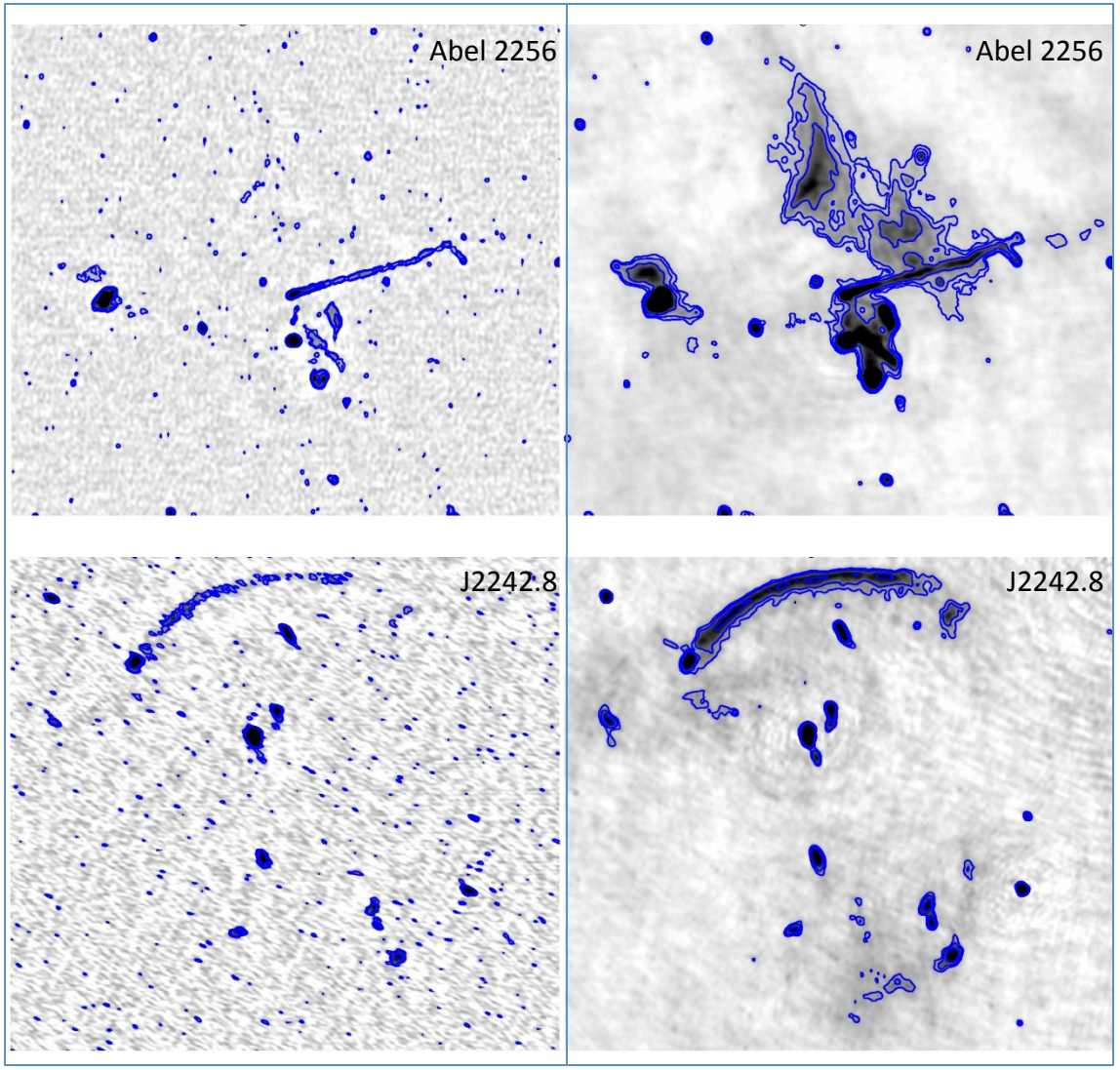
Jansky VLA low-band observations

The first P-band science observations were made on Sept 13-14, 2012 with the VLA in BnA configuration using 10 antennas equipped with working P-band receivers.

The merging galaxy clusters Abell 2256 (top left) and CIZA J2242.8+5301 (the `sausage' cluster, bottom left) were each observed for 3 hours. Images were made using 30% of the available bandwidth at P-band (87.5 MHz total bandwidth at 300 MHz central frequency). The resulting RMS noise is ~0.5 mJy/ beam in both images.

Deep GMRT images (26 MHz total bandwidth at 325 MHz central frequency) are shown on the right. There is good agreement between compact features in the VLA and GMRT images. Large-scale emission is not detectable by the VLA due to missing short baselines.

VLA P-band images | Comparison GMRT images

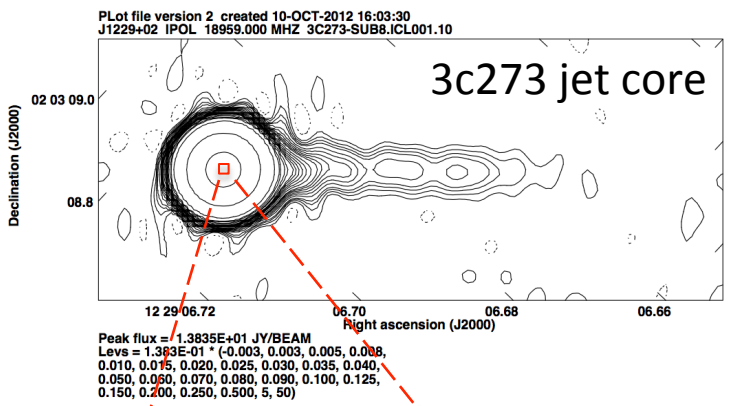


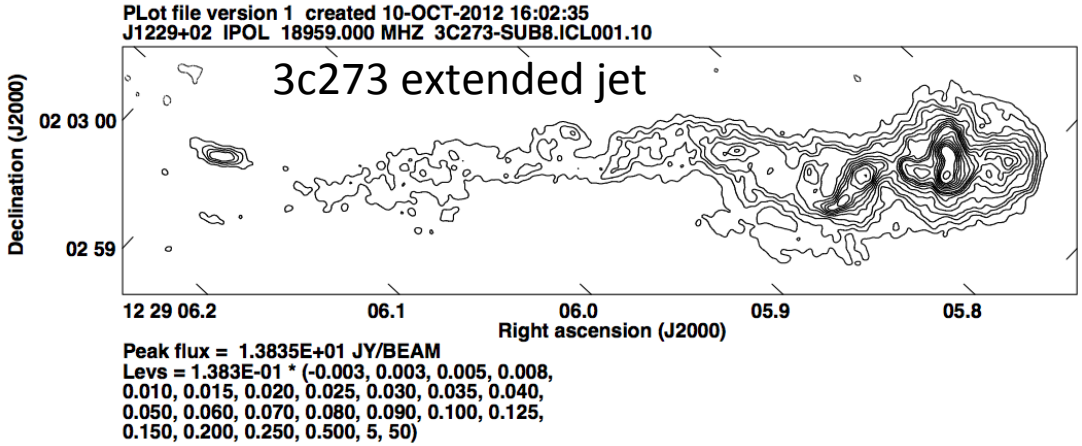
3c273 with the VLA (3-bit samplers) & VLBA + phased-array VLA

- **VLA 3-bit samplers:** Observations of 3c273 were made with the VLA 3-bit samplers in K-band (18,959 GHz center frequency) continuum with a total on source integration time of 76 minutes. The preliminary image on the next page is to verify the scientific validity of an image using the 3-bit samplers. It was created from a single 128 MHz sub-band (a small sub-set of the 64 sub-bands observed) and has a dynamic range of ~250,000:1. The jet core detected in these observations is the extension of the well-known "VLBI jet." The outer jet is 23 arcsec from the nucleus. Lower frequency observations have shown that the two are connected by a thin jet (not yet visible in these data). The image quality is partially limited by the uv-coverage in this 2 deg declination source and the lack of short baselines in this A configuration data.

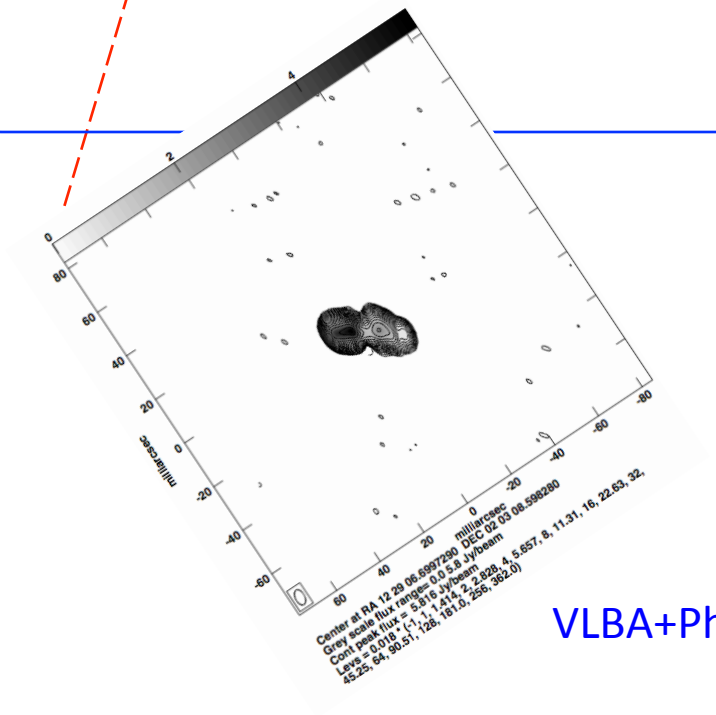
- ***Phased VLA + VLBA:*** Test observations of 3c273 in C-band were made on Sept. 20, 2012 with the nine VLBA antennas plus the phased VLA. The test was designed to validate changing sub-band bandwidths during an observation. The test was correlated on with the VLBA's DifX correlator. Fifteen minutes of on source data using 2x128 MHz bandwidth (equivalent to the largest bandwidth the VLBA can currently achieve) were extracted, reduced in the standard way with AIPS and then imaged (see figure on next page). The phased VLA offers primarily increased sensitivity in this observation. The VLBI jet is clearly detected with a peak of 5.8 Jy/beam.

3c273 with the VLA (3-bit samplers) & VLBA + phased VLA





VLA using the 3-bit samplers



VLBA+Phased VLA