GMRT low frequency calibrator list

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Abstract. A fundamental need of Giant Metrewave Radio Telescope (GMRT) users is to use the best calibrators for a given observing program. For GMRT observations, the user normally refers to the Very Large Array (VLA) calibrator database (meant for higher frequency VLA observations) to search for suitable calibrators.

The main objective of project is to provide a list of suitable low frequency calibrators for GMRT giving detailed information of the calibrators, *i.e.*, auxiliary products. Here we present, calibrator manual along with selection criteria of the target list for the first released list of calibrator sources to be used for low frequency GMRT observations, including screen-shots of both image and (u, v) plot, FITS image, source model (files) for use in AIPS/casapy, etc. at 610 MHz and 235 MHz.

1. Selection methodology

We select our list of target calibrator fields from the VLA calibrator manual which met the following criteria:

I $S_{1.5 \text{ GHz}} > 0.5$ Jy, and at 1.5 GHz, source should be (a) a P-class at A-array and B-array VLA configurations, and (b) either a P-class or a S-class at C-array and D-array VLA configurations. These criteria provided us with a list of 121 sources.

II The source should be a S-class at A-array VLA configuration at 325 MHz. This criteria provided us with a list of 77 sources.

Other sources in VLA calibrator manual, i.e.,

III $S_{1.5 \text{ GHz}} > 0.5$ Jy, and at 1.5 GHz, (i) the source is either a P-class or a S-class at A-array or B-array VLA configurations (301 sources) and (ii) rest 250 sources.

IV At 325 MHz, (i) the source should be a S-class at B-array VLA configuration (51 sources) and (ii) rest 34 sources.

Here, we present our first results for ~40 sources from the priority I list.
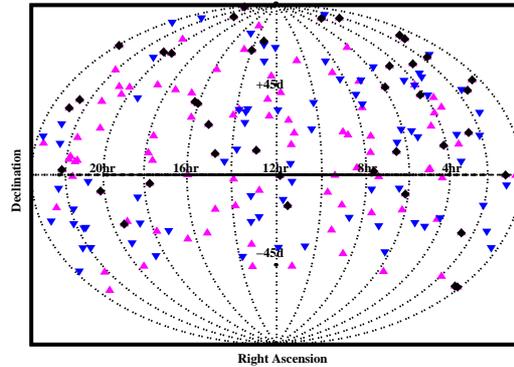
Figure 1. "Black diamonds" show our first release of 40 calibration fields at 610 and 235 MHz from the lists of 121 sources gleaned at 1.5 GHz from the VLA calibrator manual, shown as "red upper-triangles" lists our 121 sources. The "blue lower-triangles" lists our calibrator targets gleaned at 325 MHz from the VLA calibrator manual, which form our priority II targets.

2. Results and future plans

We have completed the analysis for ∼40 calibration fields, and have released the same. The (u, v) plot, screenshot images, model files, including FITS images and clean component files, of these calibration fields are available at

`http://www.gmrt.ncra.tifr.res.in/gmrt_hpage/Users/Help/CAL/Cal-List.html`.

As we make progress, we plan to add results for new calibration fields to this list and provide calibration fields across entire sky seen by GMRT. Presently, we have the following tasks to accomplish: (i) Analyse the available data for the 10 remaining sources, and plan and make new observations for the unobserved fields. (ii) Complete the analysis of all (priority I) calibration fields, add imaging details, spectra, methodology, artefacts and issues encountered, etc. for unusual calibration fields, if any. (iii) Finally, extract 325 MHz data (priority II) for these fields from the GMRT archive and populate the products on the calibrator manual URL.

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