# CASDA – HIPASS cubes (uploaded in May 2018)

README.txt file by B. Koribalski, 17 May 2018

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## Key HIPASS References and catalogs

- The **Parkes 21-cm multibeam receiver**: Staveley-Smith et al. 1996, PASA 13, 243.
- HIPASS southern **observations, calibration and robust imaging**: Barnes et al. 2001, MNRAS 322, 486.
- The **HIPASS Bright Galaxy Catalog (HIPASS BGC)** contains the 1000 HI-brightest sources (mostly galaxies and a few HI clouds) in the southern sky (DEC < 0 degr) and, where available, their stellar counterparts: Koribalski et al. 2004, AJ 128, 16.
- The **HIPASS Catalog (HICAT)**, DEC < 0 degr, $v_{GSR}$ > 300 km/s, contains 4315 HI sources (mostly galaxies and a few HI clouds): Meyer et al. 2004, MNRAS 350, 1195. Optical IDs and properties are published in HOPCAT (Doyle et al. 2005, MNRAS).
- The **HIPASS Northern Catalog (NHICAT)**, DEC > 0 degr, $v_{hel}$ > 300 km/s, contains 1002 sources (mostly galaxies and a few HI clouds): Wong et al. 2006, MNRAS 371, 1855. Optical/Infrared IDs are published in NOIRCAT (Wong et al. 2009, MNRAS 399, 2264).
- The **HIPASS High Velocity Cloud (HVC) Catalog**, DEC < +2 degr, -500 < $v_{LSR}$ < +500 km/s: Putman et al. 2002, AJ 123, 873.

**Acknowledging HIPASS data.**

This data is provided under the auspices of the Multibeam Survey Working Group. Users are requested to (1) acknowledge the ATNF in any publications as follows: "The Parkes telescope is part of the Australia Telescope which is funded by the Commonwealth of Australia for operation as a National Facility managed by CSIRO", and (2) cite the appropriate HIPASS papers, in particular Barnes et al. (2001); see the list above.

**HIPASS webpages.**

- http://www.atnf.csiro.au/research/multibeam/

**CSIRO contact for HIPASS.**

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**HIPASS cubes (H001 to H538).**

There are 538 HIPASS cubes covering the whole southern sky and part of the northern sky from the south pole (cube H001) to declinations of about +25 degrees. Most HIPASS cubes have 170 pixels times 160 pixels. The pixel size is 4 arcmin. Each HIPASS cube has 1024 planes, each 13.2 km/s wide, covering a velocity range of -1200 < cz < +12700 km/s. The cube velocity axis is in the "radio definition"; for most extragalactic work conversion to the "optical definition" is suggested. Apart from cube H001 (south pole) and possibly the northern-most cubes (running out of sky that the telescope can see), all cubes are 8 degr x 8 degr. This was determined by our observing/scanning strategy.

- **Angular Resolution.**
  The gridded Parkes beam is typically 15.5 arcmin (for details see Barnes et al. 2001).

- **Positional Accuracy.**
  For HIPASS point sources a good estimate of the uncertainty of the point source fit is gridded beam size divided by signal-to-noise.

- **Velocity Resolution.**
  The velocity resolution of HIPASS cubes is 18 km/s. In order to suppress the Gibbs ringing in multibeam HI spectra, while retaining most of the information in the signal, a Tukey filter was selected for smoothing purposes (for details see Barnes et al. 2001). The channel width is 13.2 km/s.

- **HIPASS sensitivity.**
  The typical rms is 13 mJy/beam per channel.

**HIPASS Data Release.**

- HIPASS public data release - v1.2 May 13, 2000 (south)
- Parkes ZOA public data release - v1.0 Oct 11, 2002
- HIPASS public data release - v1.0 Oct 14, 2004 (north)
  (untrimmed, luthered cubes)

**Milky Way and High Velocity Clouds (HVCs).**
HIPASS cubes have 1024 planes, each representing a different velocity. The cubes include HI emission/absorption from the Galactic Plane and HVCs in the velocity range from about -300 to +300 km/s, which is not (or poorly) calibrated (see Putman et al. 2002 for alternate processing methods).

**Radio Frequency Interference (RFI).**
The data is affected by intermittent RFI (solar, 1381 MHz GPS, 1408 MHz birdie, etc.), most of which was suppressed in the image processing by using median weighting of the raw data. The latter consists of five sky coverages with the Parkes multibeam configured to achieve full Nyquist sampling (see Barnes et al. 2001). Nevertheless, some intermittent RFI remains, noticeable by the increased noise over a large fraction of the respective image plane.

**HIPASS-2.**
Improvements are under way to create second-generation HIPASS cubes where many known artefacts (e.g., intermittent RFI, spectral ripple, bandpass over-subtraction) are addressed. Some of these efforts are described in Calabretta et al. (2014, PASA 31, 7).