The Arecibo Galaxy Environment Survey - Description and Early Results

AGES is an ongoing 2000-hour survey with the ALFA multibeam system at Arecibo Observatory, targeting selected regions of the sky to \( t_{\text{exp}} = 300 \) s beam\(^{-1}\).

**Survey Goals**
- AGES will investigate how the HI mass function varies across a range of environments and find interesting HI objects such as tidally stripped galaxies and gas clouds.

**Survey Status**
- NGC 1156 - observed December 2005/January 2006. Initial results on this poster.
- Abell 1367 - observations started April/May 2006; currently about 20% complete. Initial results on the poster by Cortese et al.
- NGC 7332/7339 - observed August/September 2006. Data currently being analysed.

**New companions and tidal features around NGC 1156**
- Velocity slices through the NGC 1156 group. Contours are at 3, 5 and 10\( \sigma \).
- (a)-(e): Tidal features to the SE and N of NGC 1156 and a new companion to the N.
- (f): New companion AGES J0300+2546 to the NE.
- NGC 1156 is not as isolated as was previously thought. It has at least two companions and possibly tidal features.

**Sources beyond the NGC 1156 group**
- Digitized Sky Survey images overlaid with HI contours at 5\( \sigma \) intervals from 50: (Left): Extended gas complex in the WBL 091 group. (Right): AGES J0300+2449, an HI source with no optical counterpart. There are a total of 51 definite detections beyond the NGC 1156 group, with a further 30 possible detections scheduled for follow-up observations.

**The AGES beam shape**
- Analysis of the beam using continuum sources in the NGC 1156 field shows that the beam is very close to circular and has first side-lobes of around 5-10% in the expected position.

**Analysis of the noise in the NGC 1156 cube**
- RMS noise by velocity channel measured in the full-sensitivity region of the NGC 1156 data cube. This includes some astronomical sources: the Milky Way at 0 km/s, NGC 1156 at 400 km/s, AGES J0300+2449 at 3250 km/s, and the WBL 091 group at 10,500 km/s. Radio Frequency Interference (RFI) sources include the FAA radar at 15500 km/s, with harmonics at 5800 and 7000 km/s, and GPS satellites at 8500 km/s.
- The distribution of pixel values in an RFI-free section of the datacube (marked in red above), overlaid with the expected Gaussian distribution for an RMS noise of 0.96 mJy. It can be seen that the noise is Gaussian in the cube, with the only deviations coming at positive values, where real sources would be expected to contribute to this plot.

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