

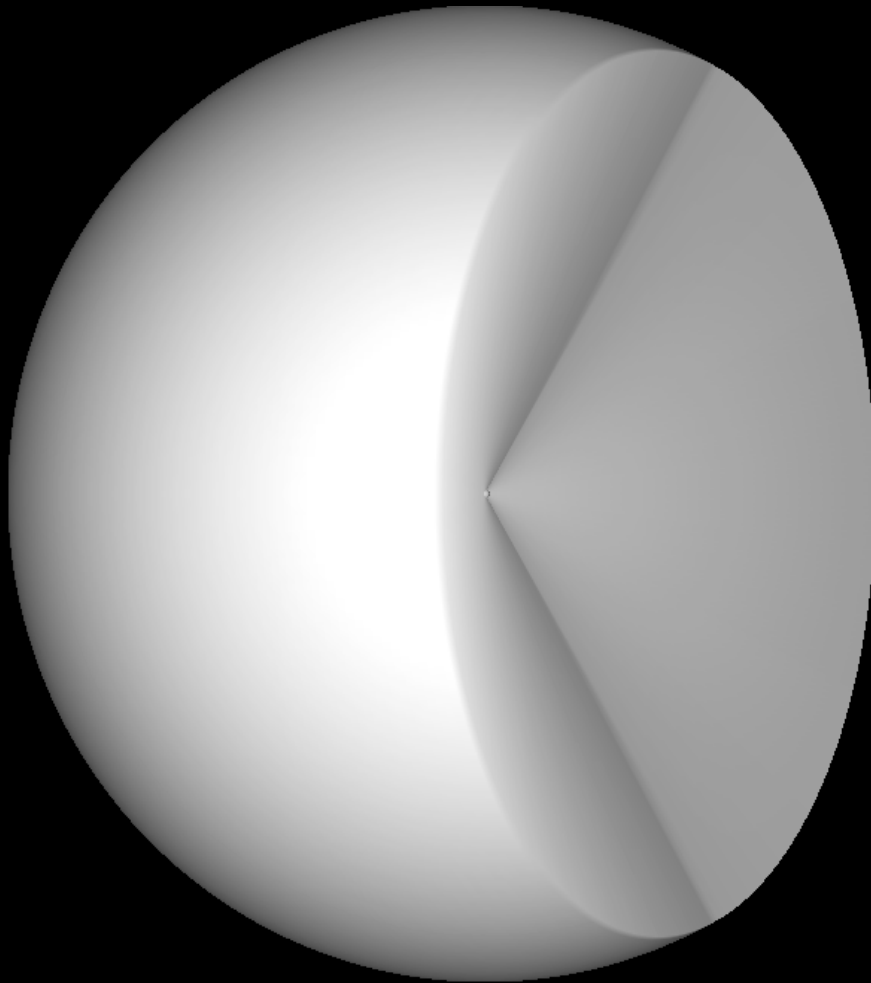
AGES, AUDS, ALFALFA, ZOA

Surveying the extragalactic sky
from A to Z

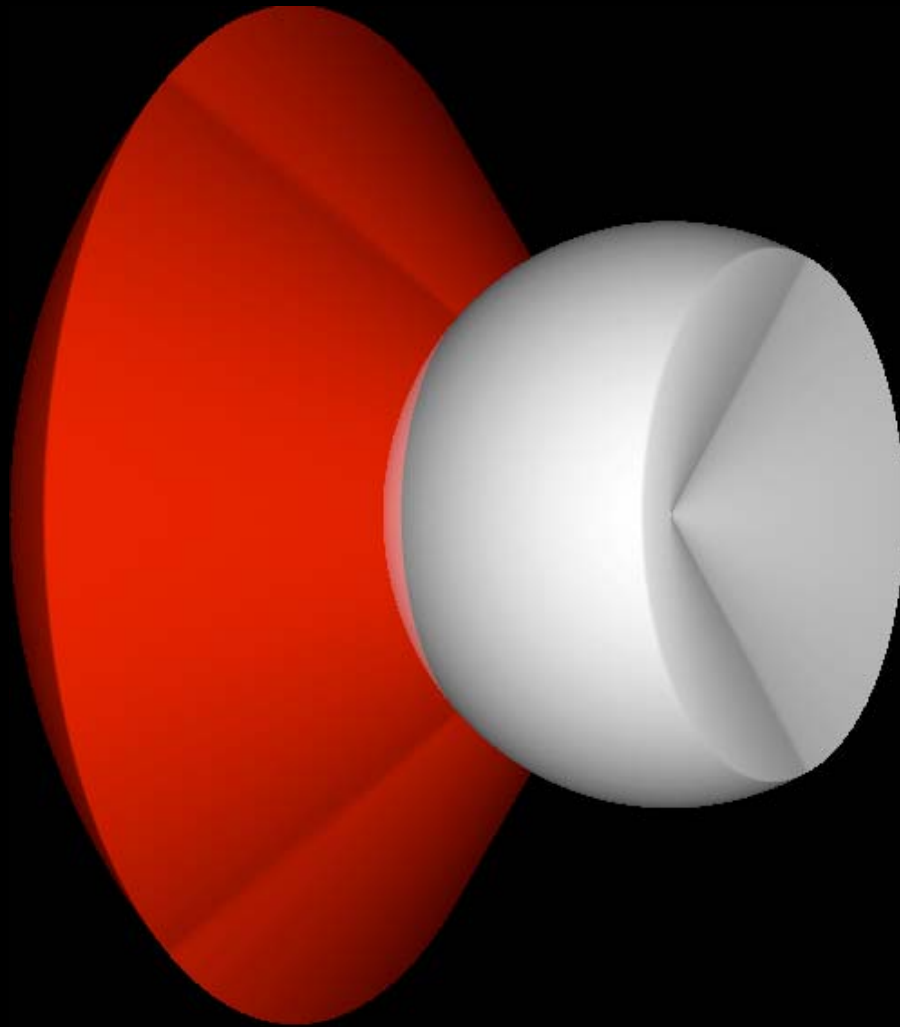
Four different surveys

- ALFALFA - wide angle, shallow survey covering 7000 deg²
- AGES - deeper survey targeting different environments - clusters, groups and voids
- AUDES - very deep survey for HI at $z > 0.1$
- ZOA - survey of the galactic plane - piggy-backing on other surveys

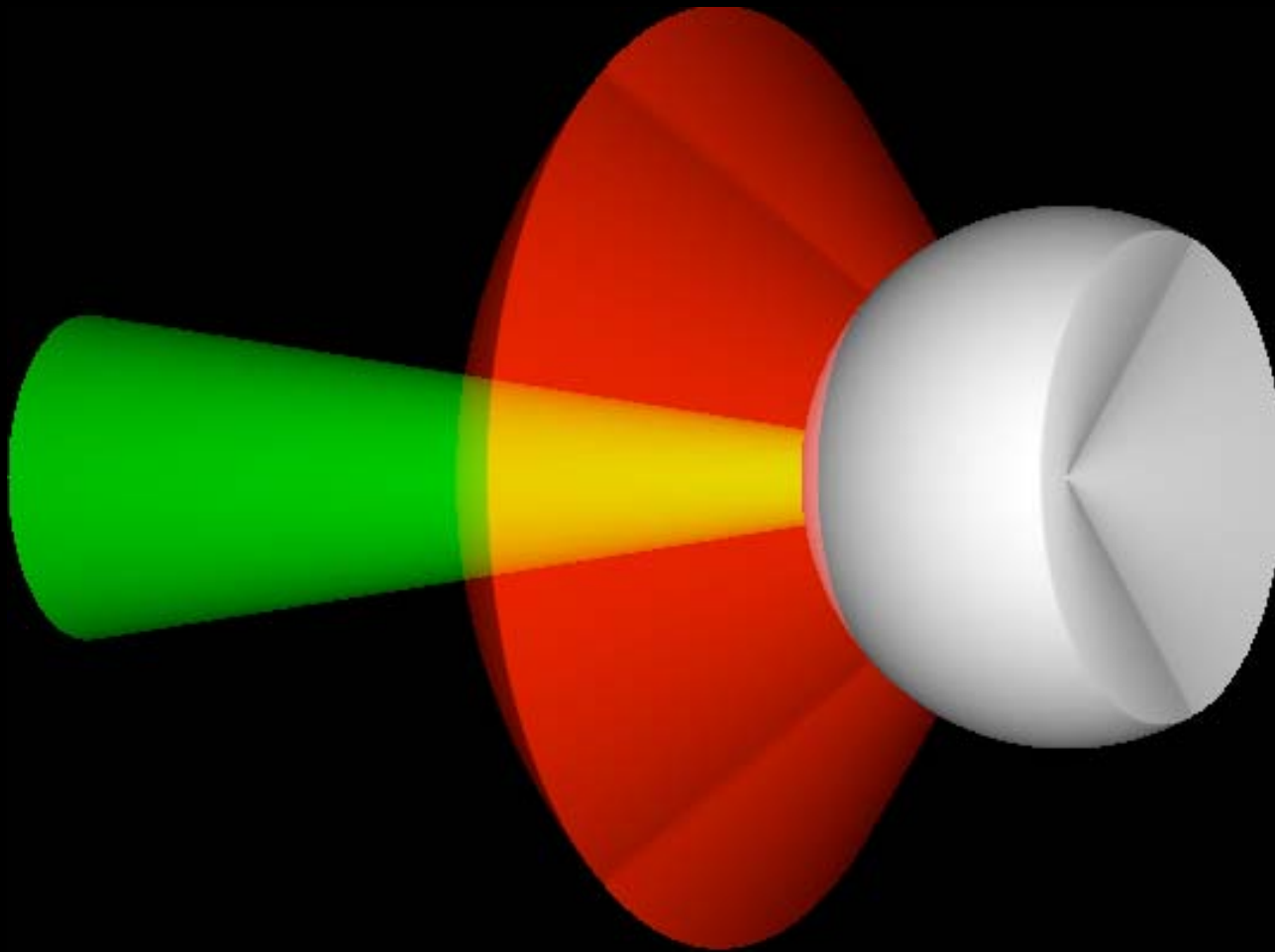
HIPASS



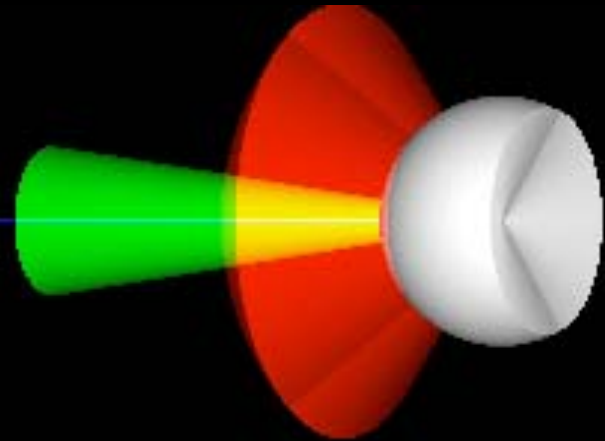
ALFALFA



AGES



AUDS



ALFALFA

- Two-pass, meridian drift-scan survey
- Three times the volume of HIPASS
- Best definition to date of the HI Mass Function (HIMF)
- Capable of picking out interesting low-mass objects with high-resolution

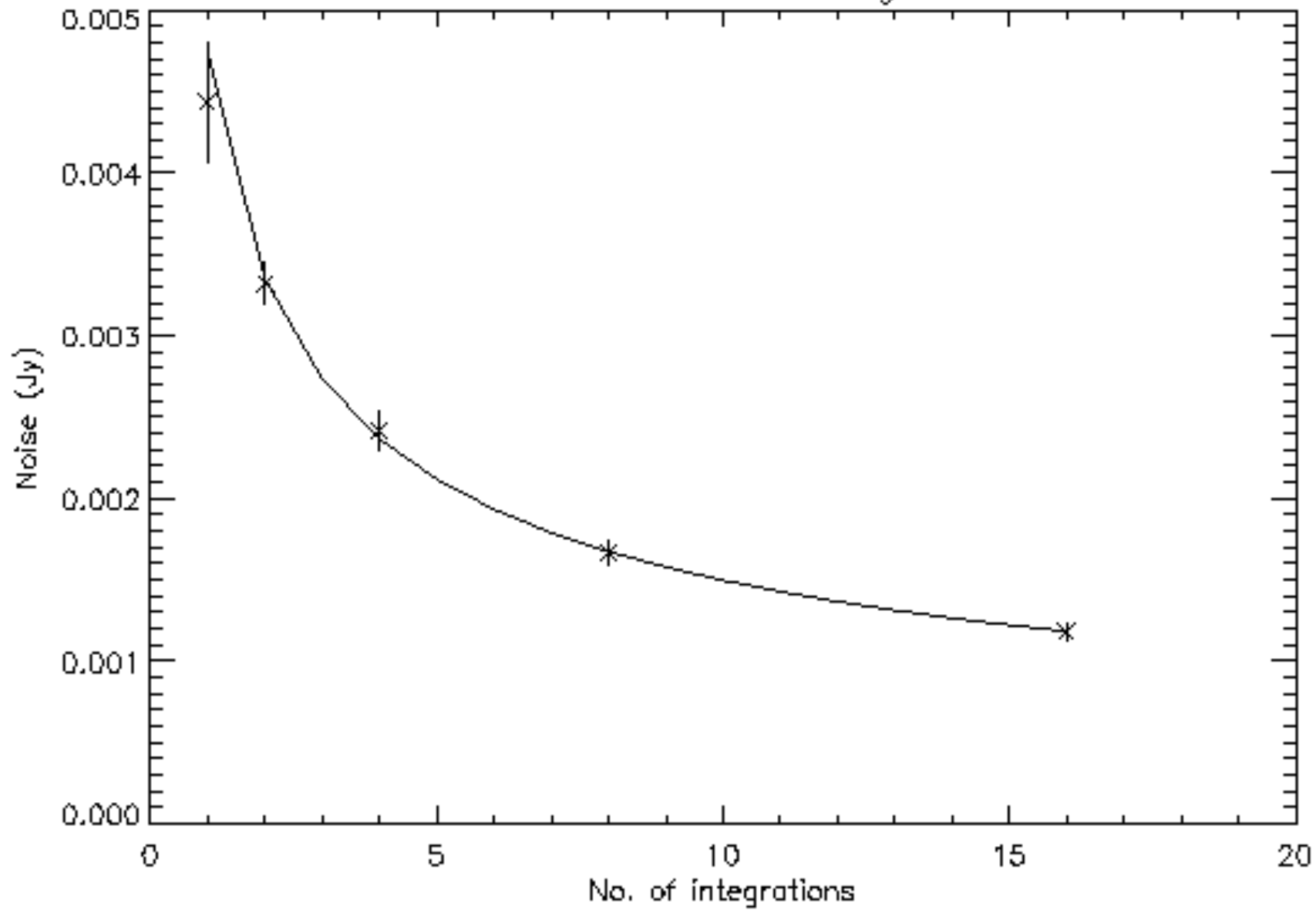
AGES

- 24-pass drift survey (300s)
- Covers different regions:
 - Virgo Cluster (2 fields)
 - Local Void
 - M33 and the Pisces-Perseus filament
 - Abell 1367 cluster
 - Leo I, NGC 7448 and NGC 3193 groups
 - NGC 6555, NGC 2577, NGC 7332, UGC 2082 and NGC 1156 galaxies.

AGES Precursor Observations

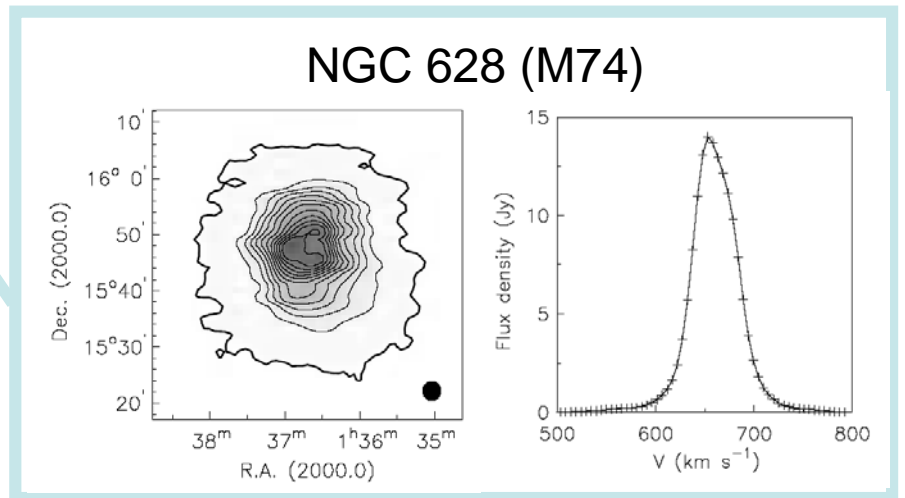
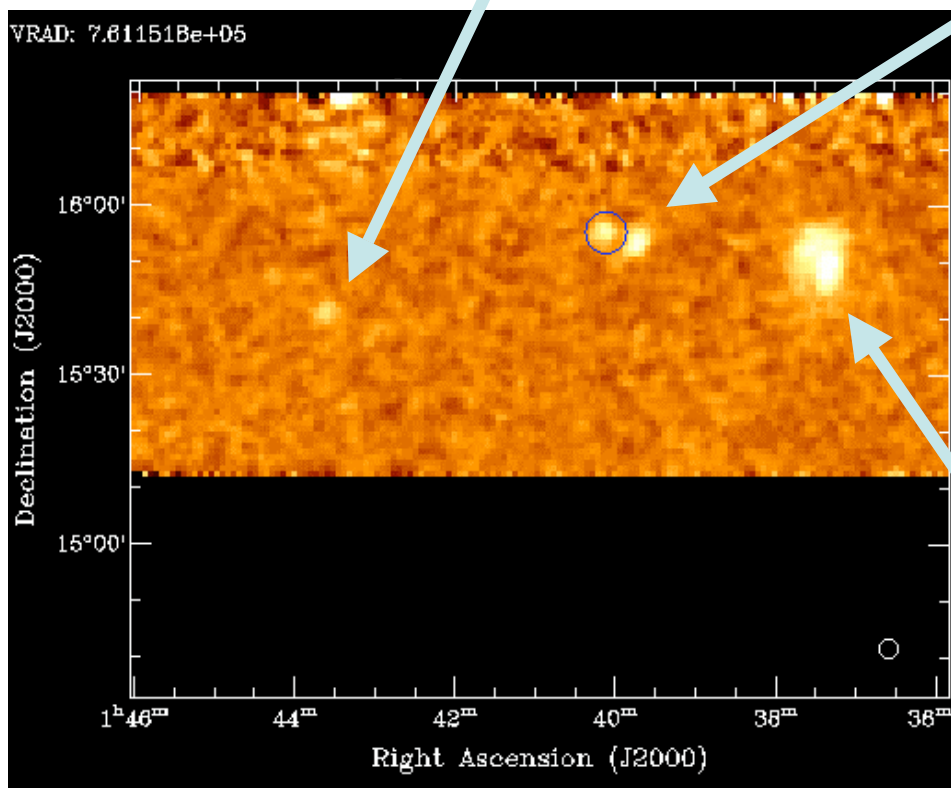
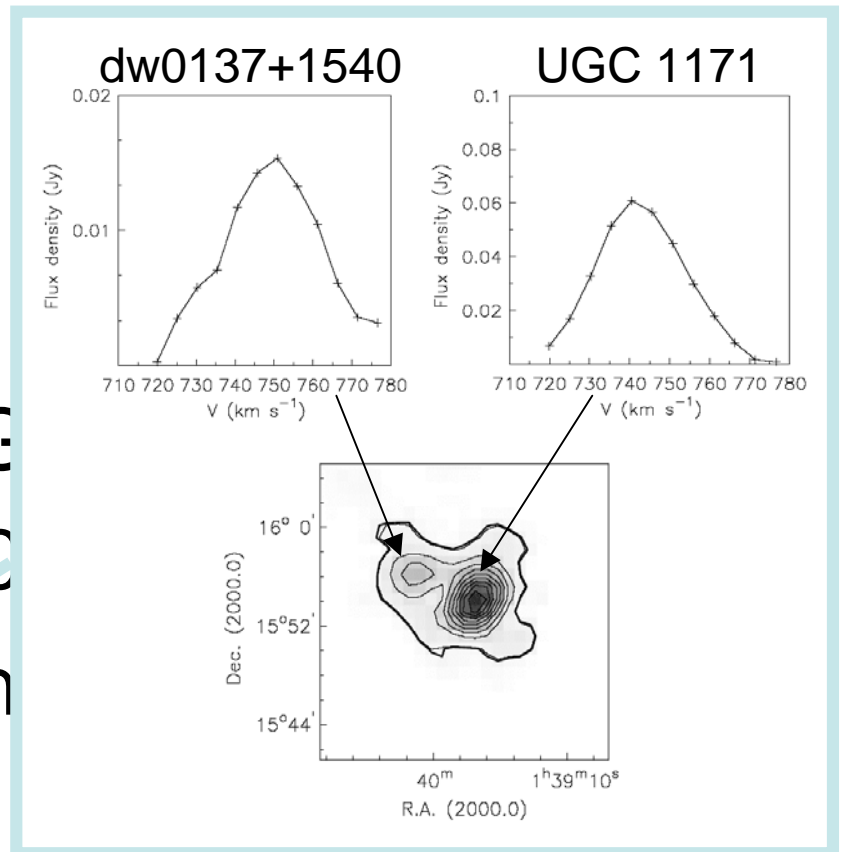
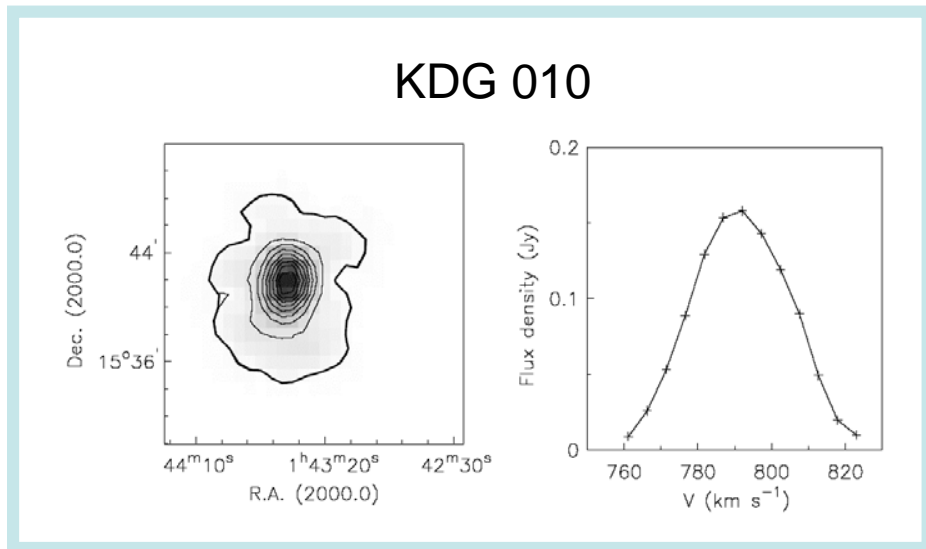
- Targeted the M74 (NGC 628) group
- Noise falls as \sqrt{t} (to 200s)

Noise vs. number of integrations



AGES Precursor Observations

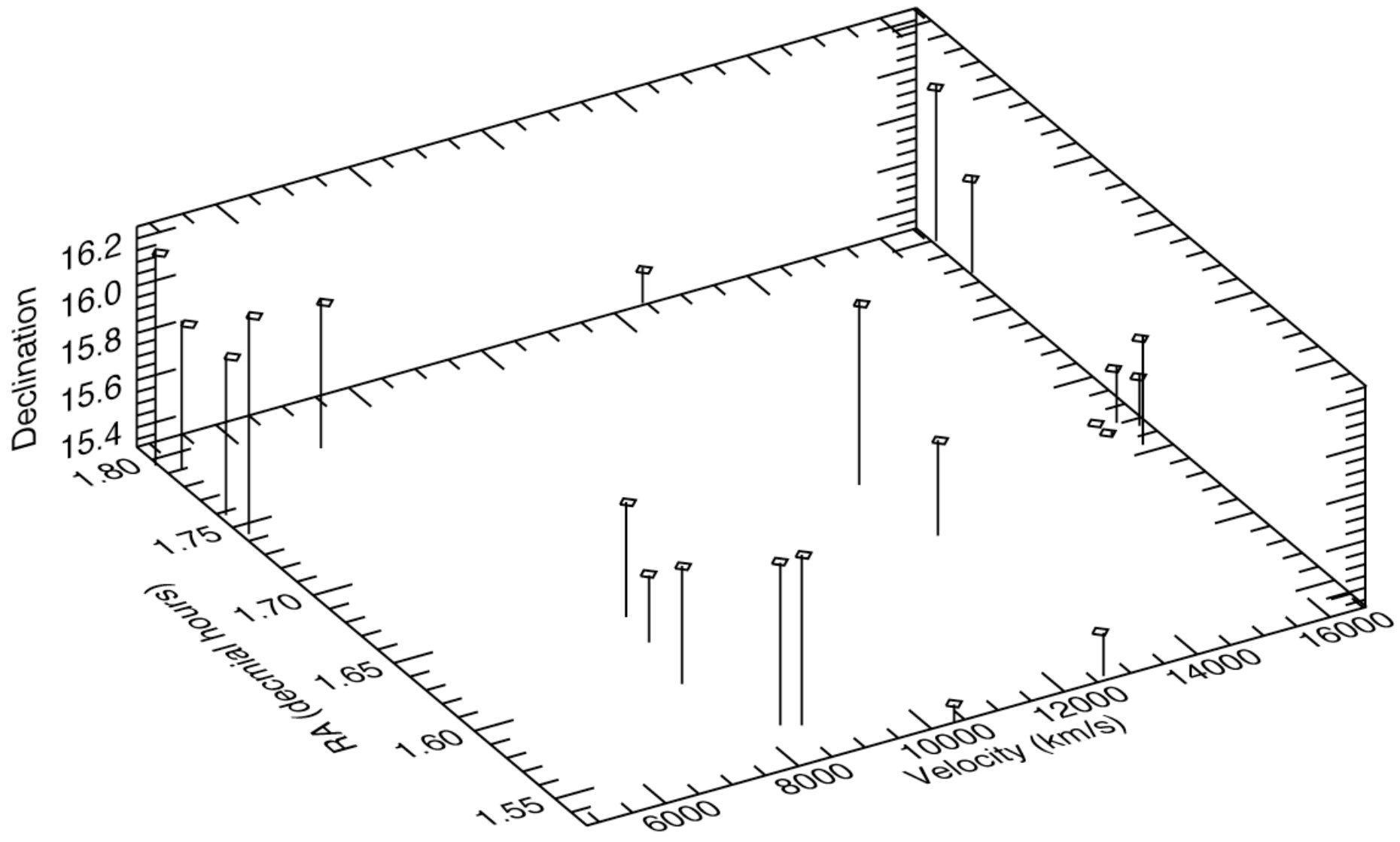
- Targeted the M74 (NGC 628) group
- Noise falls as \sqrt{t} (to 200s)
- Detected 5 galaxies in the group



or
NGC
s in

AGES Precursor Observations

- Targeted the M74 (NGC 628) group
- Noise falls as \sqrt{t} (to 200s)
- Detected 5 galaxies in the group
- Detected 22 objects behind the group



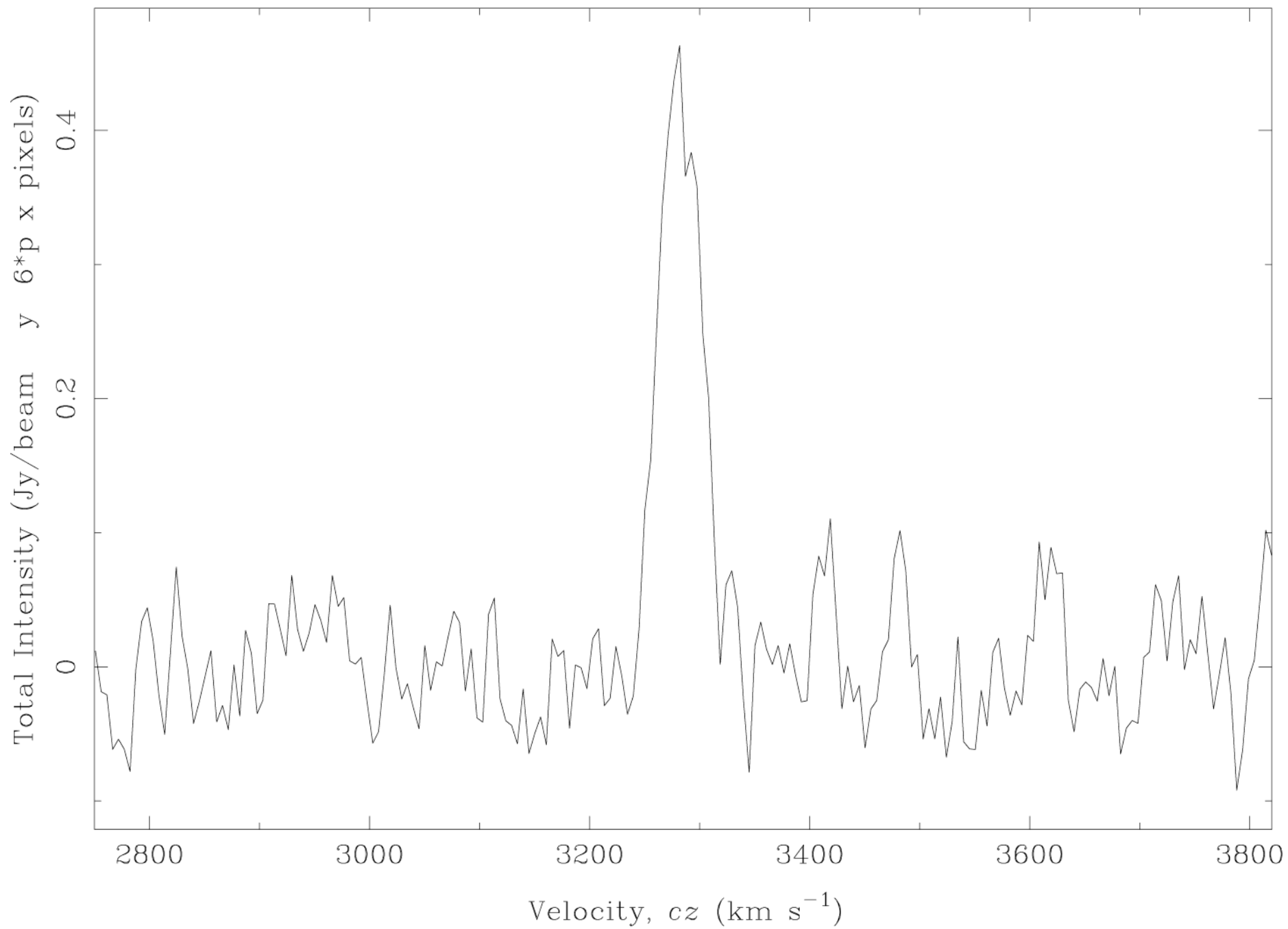
AGES Precursor Observations

- Targeted the M74 (NGC 628) group
- Noise falls as \sqrt{t} (to 200s)
- Detected 5 galaxies in the group
- Detected 22 objects behind the group
 - 8 previously uncatalogued
 - 3 with SDSS redshifts
 - None have previous HI measurements

AGES Initial Results

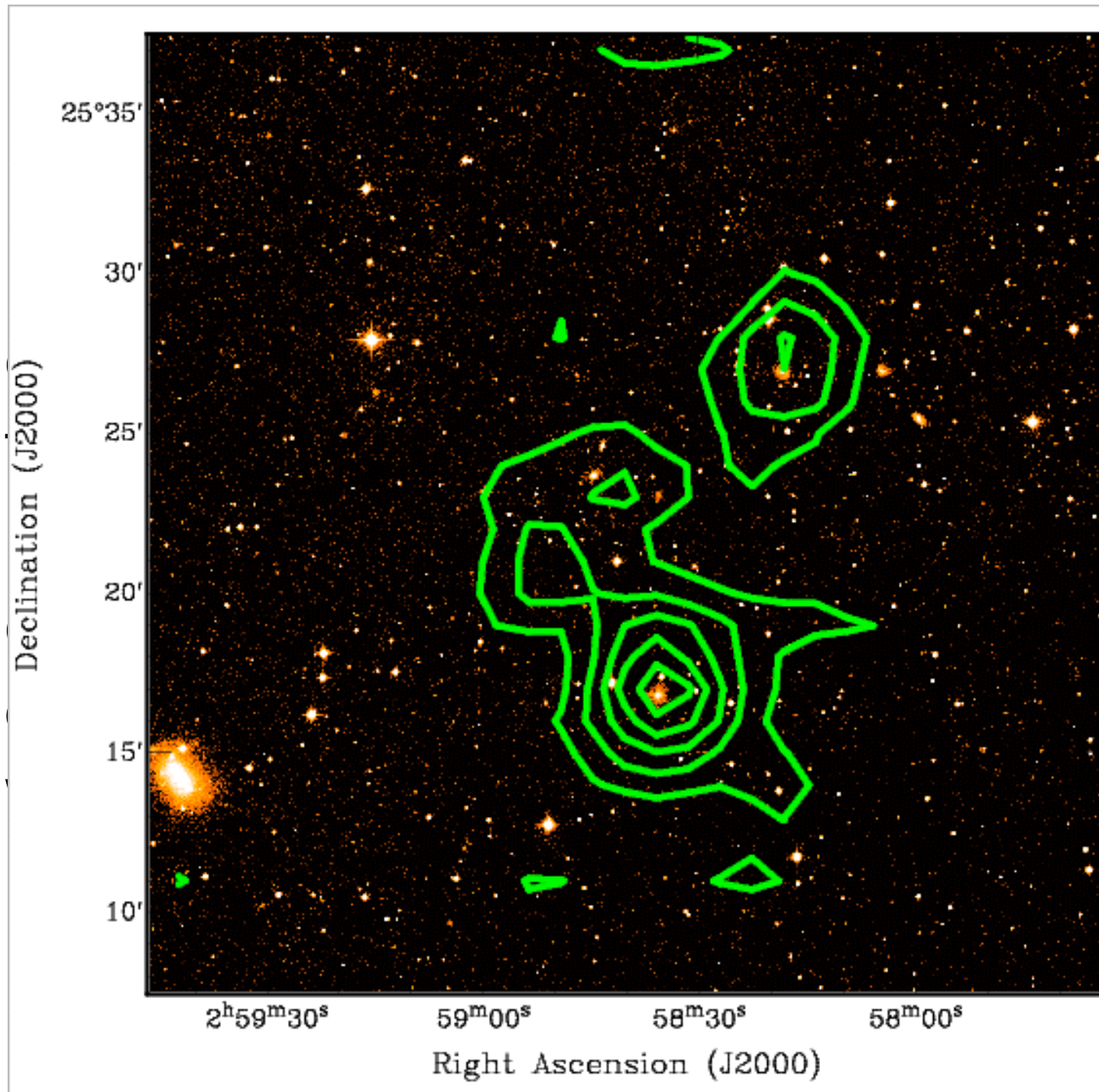
- Observations began December 2005 targeting the field of NGC 1156
- First coverage (4 passes) completed
- One previously uncatalogued galaxy detected so far (3300 km/s)

AGES J0302+2448



AGES Initial Results

- Observations began December 2005 targeting the field of NGC 1156
- First coverage (4 passes) completed
- One previously uncatalogued galaxy detected so far (3300 km/s)
- WBL 091 group seen at 10500 km/s



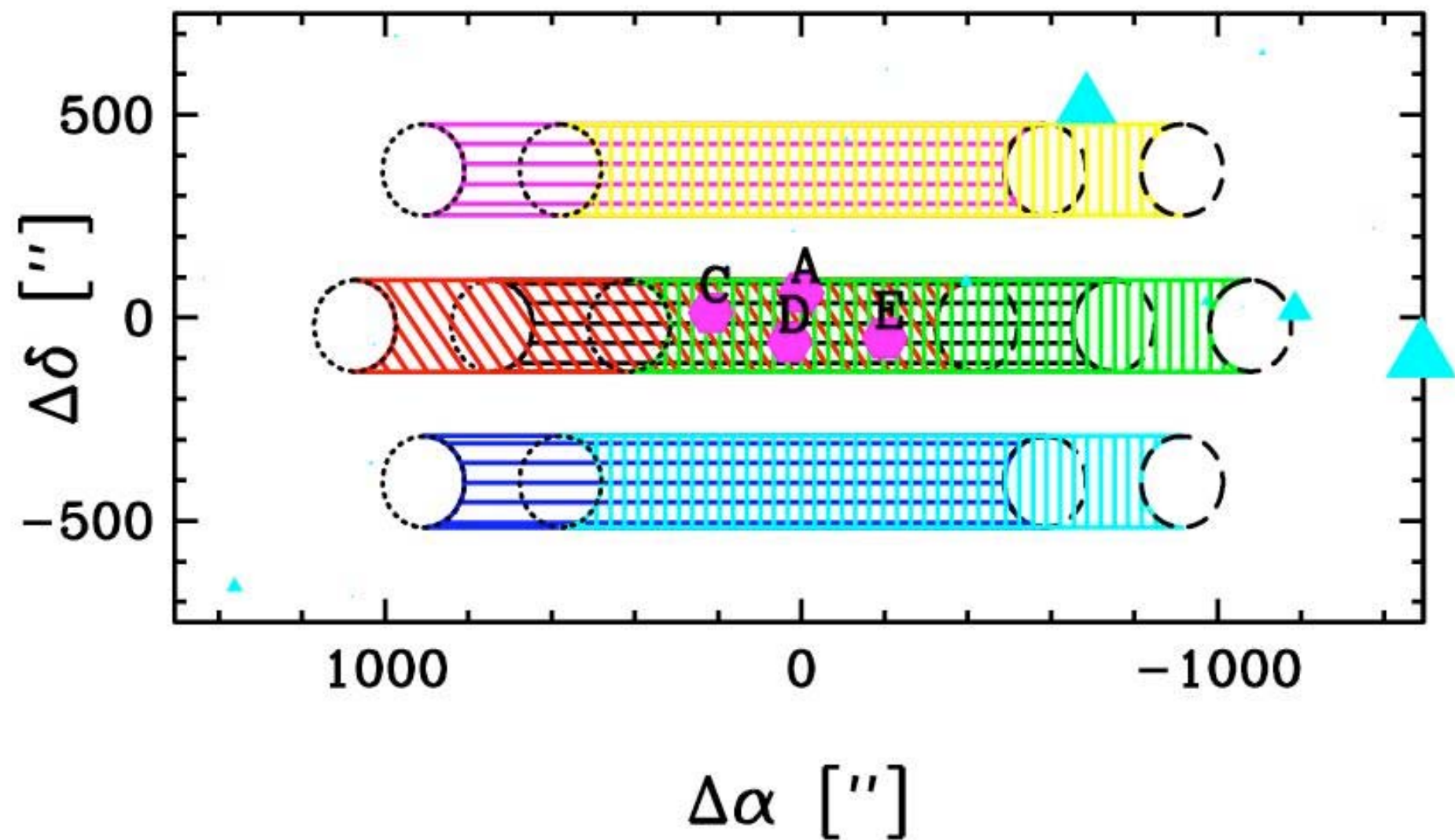
AUDS

- 40 hours integration time per beam
- Covers a small area (0.36 deg^2) with most of the volume at high redshift
- Sensitive to a few times $10^8 M_{\odot}$ at $z=0.16$
- Will study evolution of gas by determining the HIMF at $z > 0.1$
- Expected to detect 36 gals in no-evolution scenario, 50% more with strong evolution.

AUDS Precursor Observations

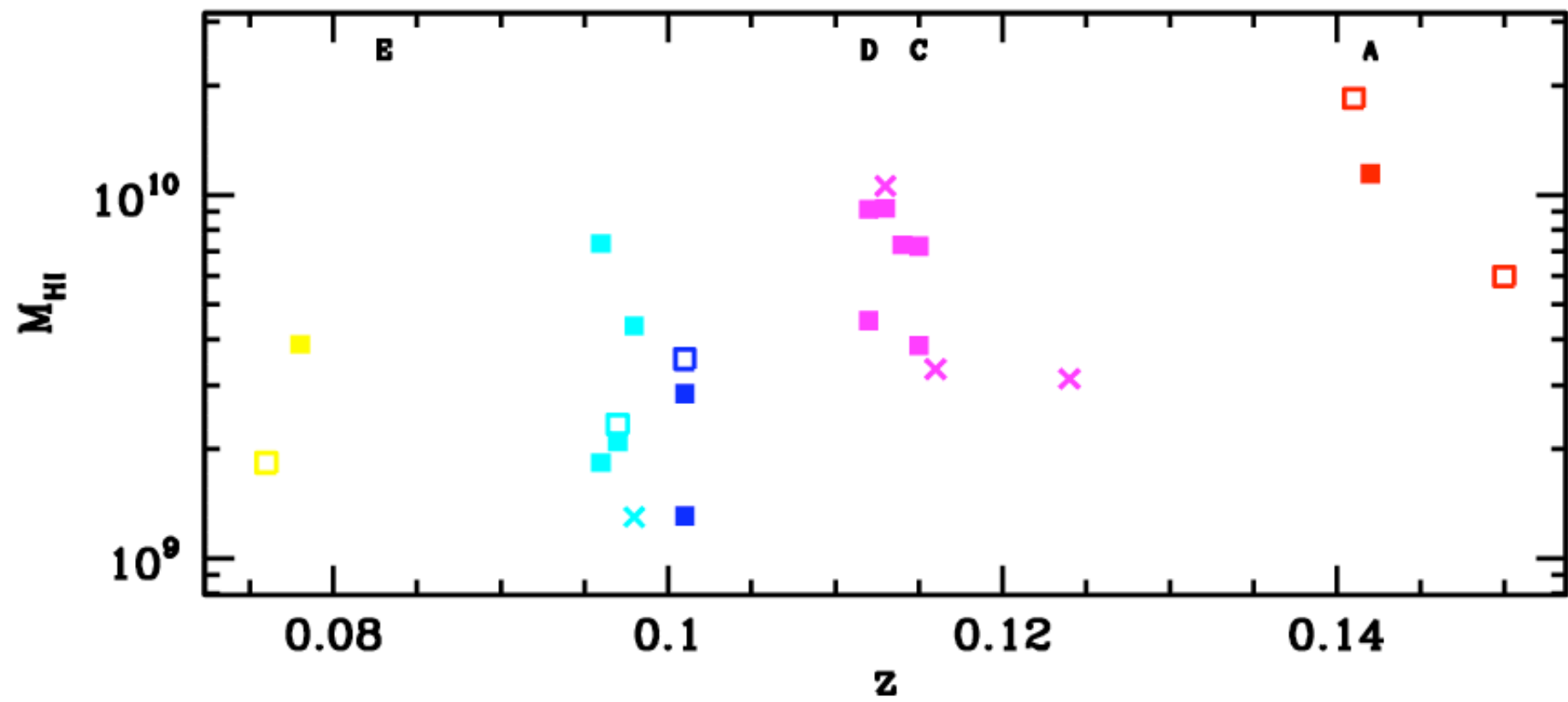
- 16 hours integration time per beam

beam 0 beam 5 beam 2 beam 4
beam 3 beam 6 beam 1



AUDS Precursor Observations

- 16 hours integration time per beam
- 9 certain & 6 possible detections at $z > 0.1$

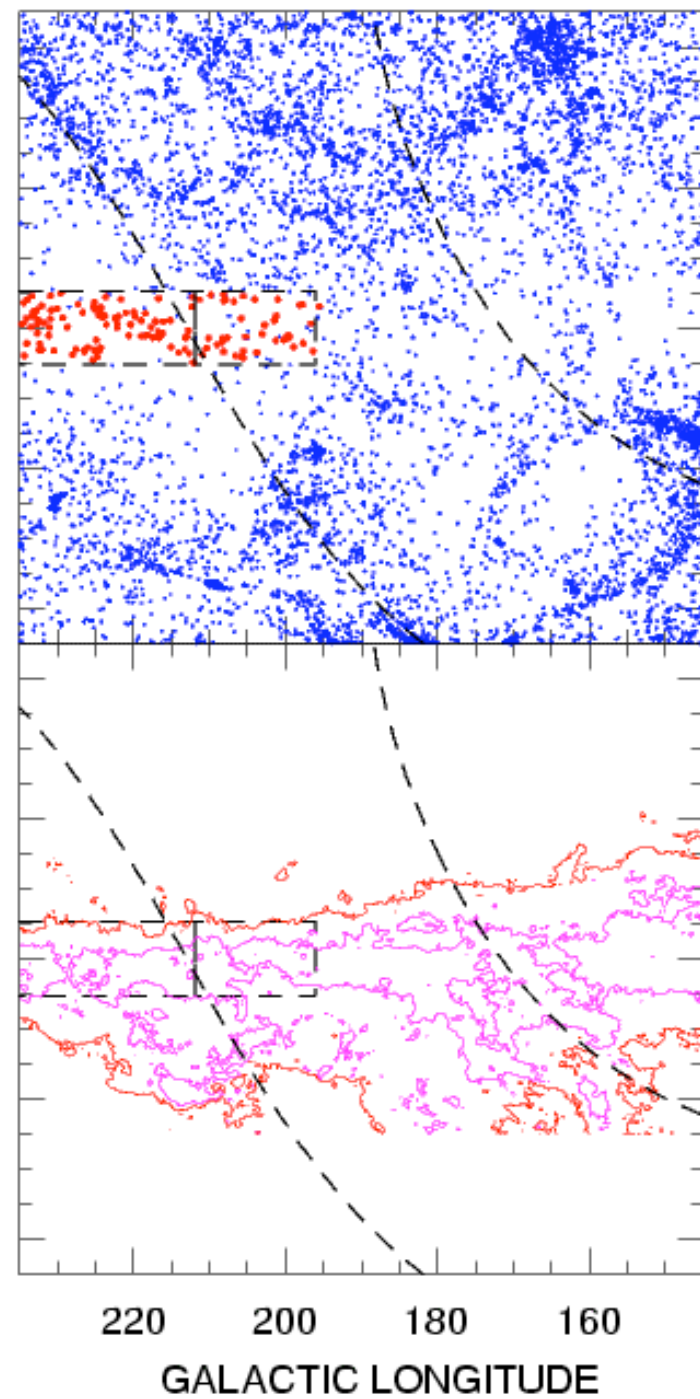
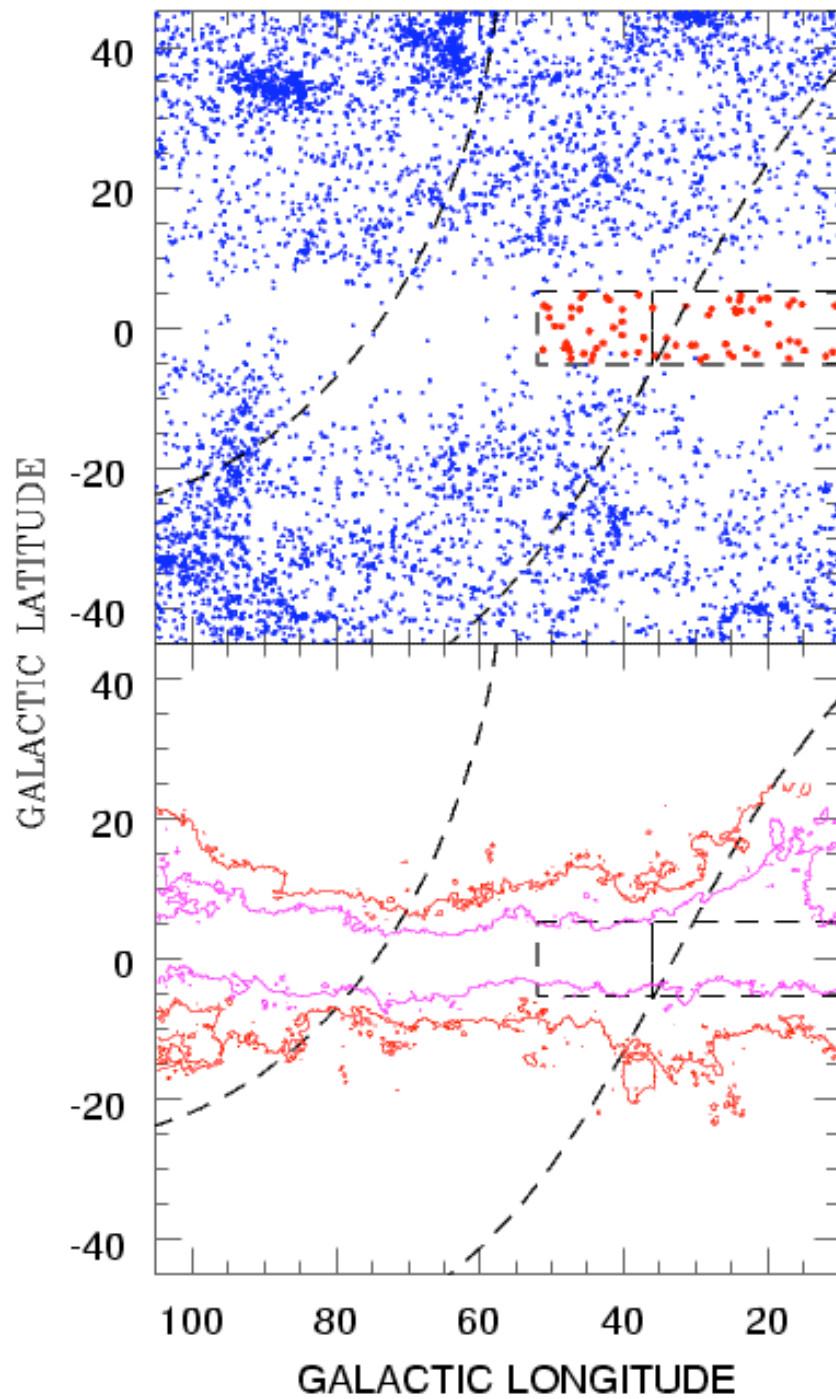


AUDS Precursor Observations

- 16 hours integration time per beam
- 9 certain & 6 possible detections at $z > 0.1$
- Detection rate 2-3 times higher than expect from the HIPASS HIMF
- Consistent with strong-evolution scenario, but with low significance
- See Freudling et al. poster (187.06)

ZOA

- Commensal survey piggy-backing on Pulsar and Galactic surveys
- Will reveal structure behind the Galactic Plane that is inaccessible to the optical



ZOA

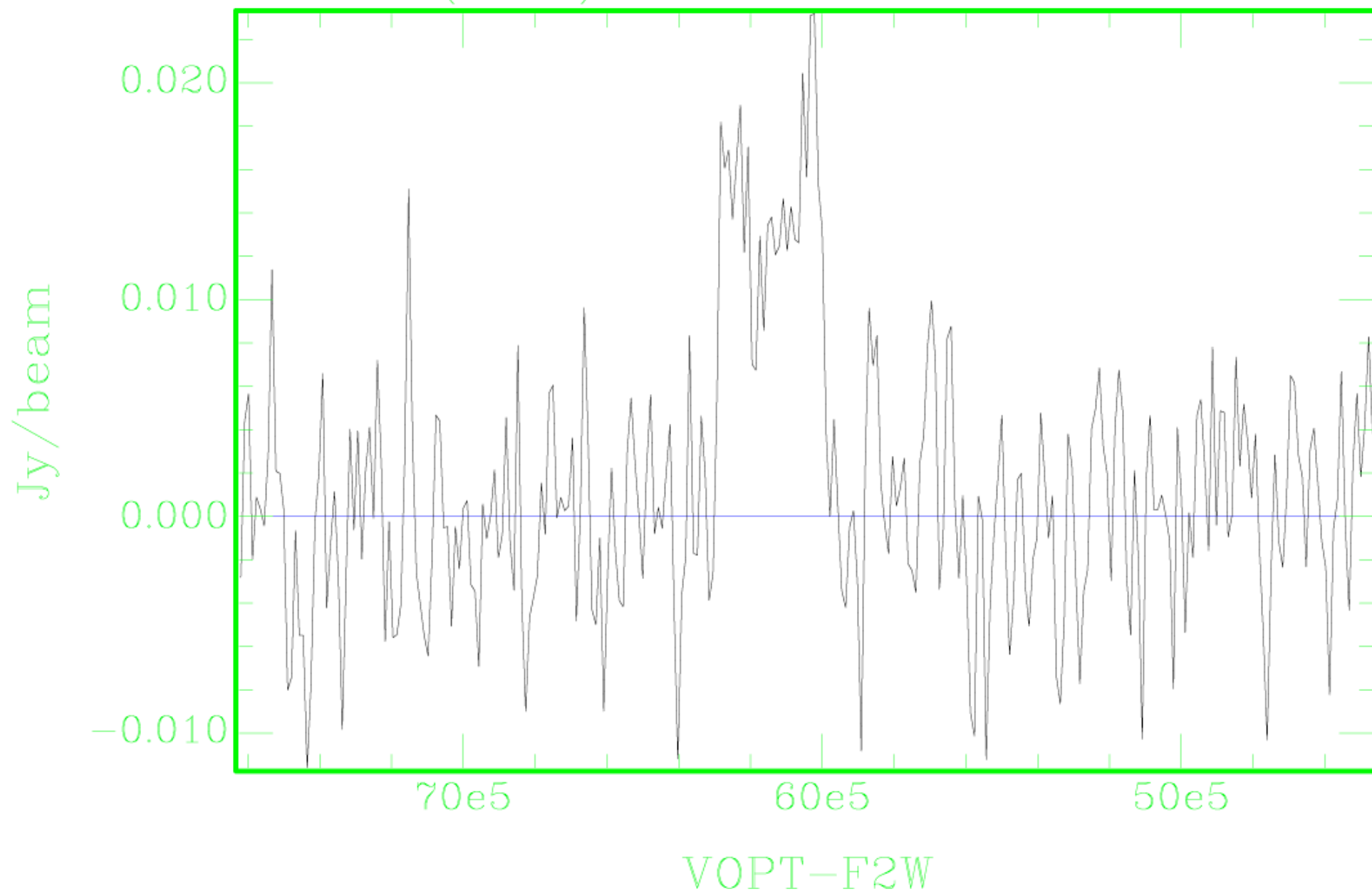
- Commensal survey piggy-backing on Pulsar and Galactic surveys
- Will reveal structure behind the Galactic Plane that is inaccessible to the optical
- Galactic surveys give a shallow coverage of a wide area
- Pulsar surveys give much deeper coverage

ZOA Initial Results

- Observations started with Galactic surveys in Summer 2005
- First observations covered 38 deg² near longitude 40^o
- Reached 6 - 6.5 mJy in 4s integration
- Detected 9 galaxies, including 6/8 of Parkes HIZOA galaxies from this region

Ra: 18^h 55^m 15.11^s (J2000)

Dec: 07° 36' 59.70" (J2000)



ZOA Initial Results

- Intend to map full ZOA in Arecibo sky
- Will take ~320 hours to cover the inner galaxy (± 10 deg) to this sensitivity
- Expect to find ~1000 galaxies
- Observations with P-ALFA surveys await the arrival of new correlators
- These will be deeper but less well sampled and covering a smaller area

Summary

- The four E-ALFA surveys offer different and complementary ways of exploring the HI content of the Universe.
- They will dramatically increase the number of known HI sources.
- Will increase our knowledge of the distribution and evolution of galaxies in a way not possible at other wavelengths.