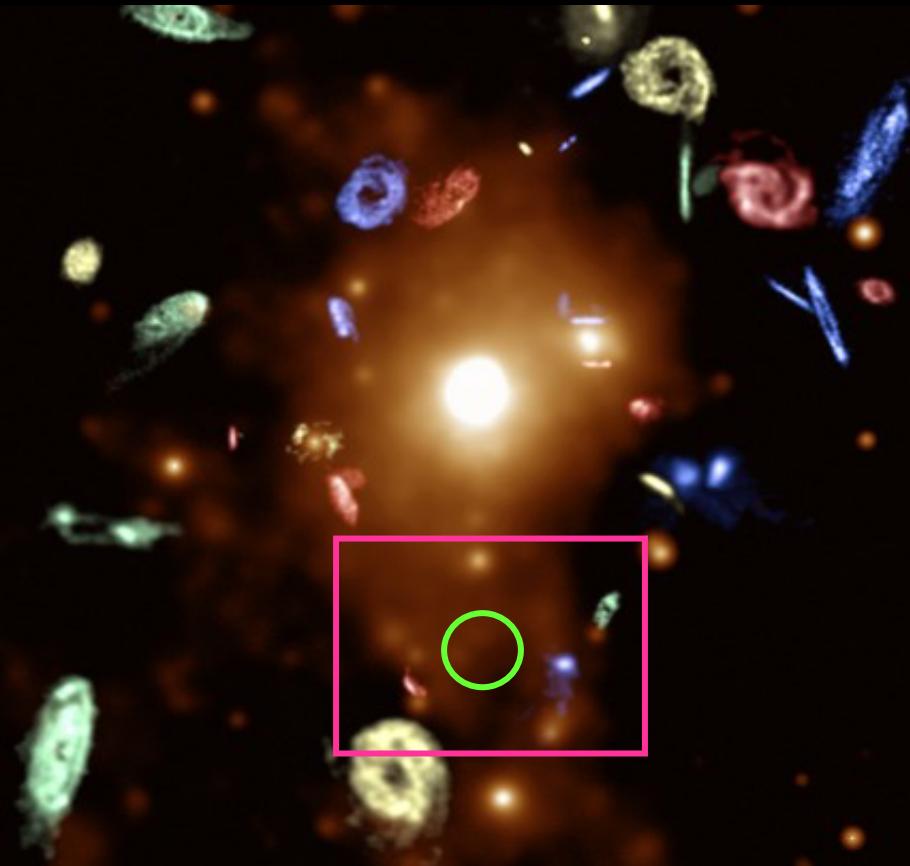


An HI Cloud Complex in Virgo: Aperture Synthesis Follow-up



$\mathcal{V} < 500 \text{ km/s}$

$600 < \mathcal{V} < 1300$

$1400 < \mathcal{V} < 2000$

$\mathcal{V} > 2000$

Chung et al. 2005

Bohringer et al. 1994

Kristine Spekkens

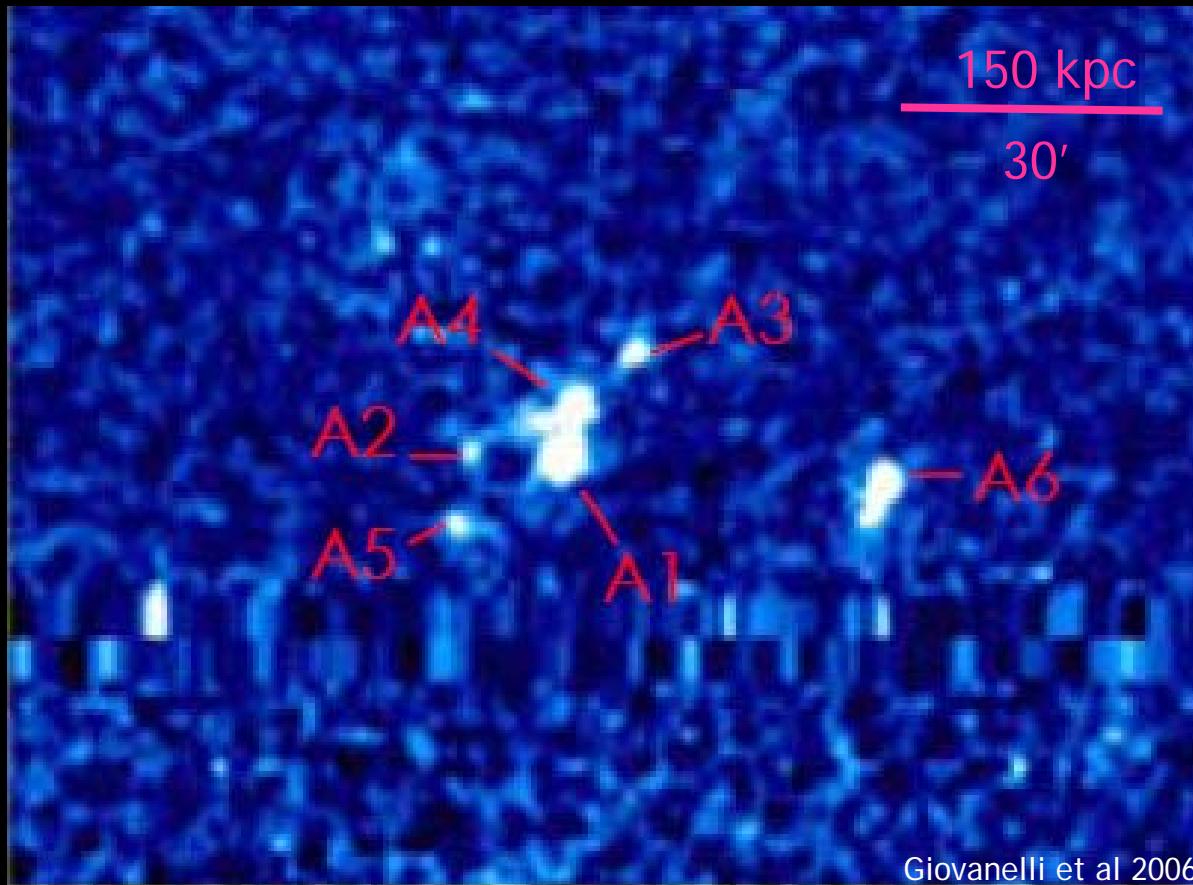
E. Momjian, B. Kent, S. Stierwalt

R. Giovanelli, M. Haynes



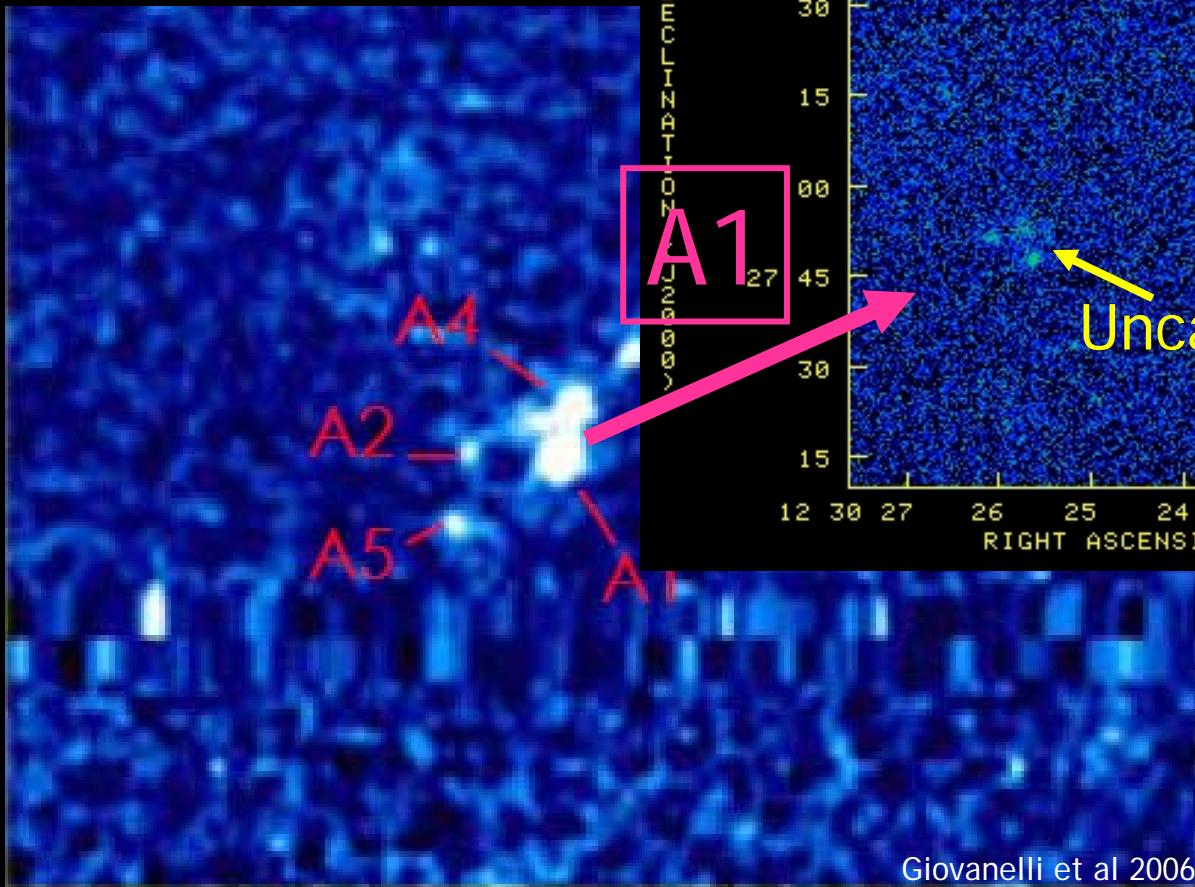
A New HI Complex in Virgo

ALFALFA Spring 2005 run:



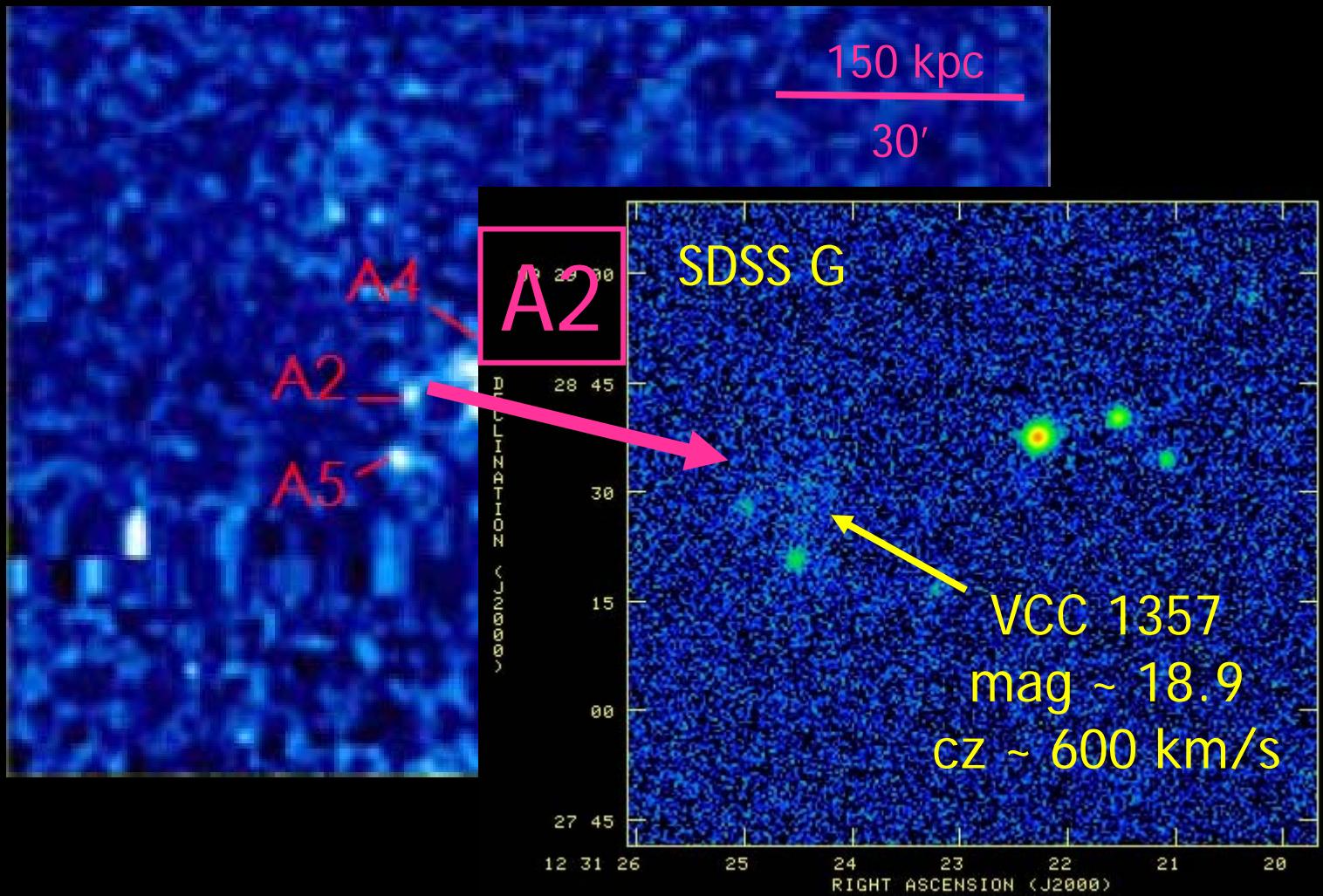
A New HI Complex in Virgo

ALFALFA Spring 2005 run:



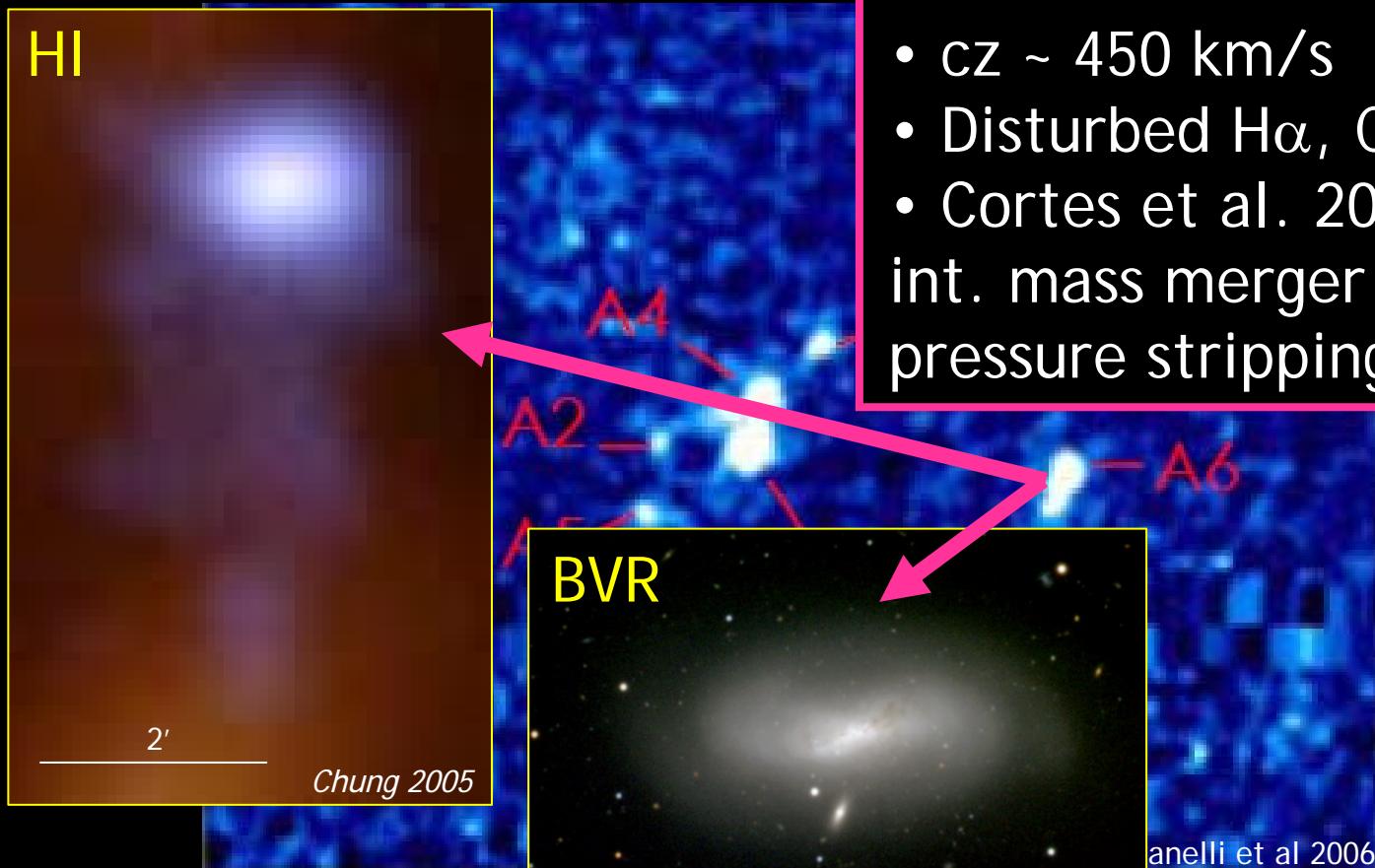
A New HI Complex in Virgo

ALFALFA Spring 2005 run:



A New HI Complex in Virgo

ALFALFA Spring 2005 run:



A6 = NGC 4424

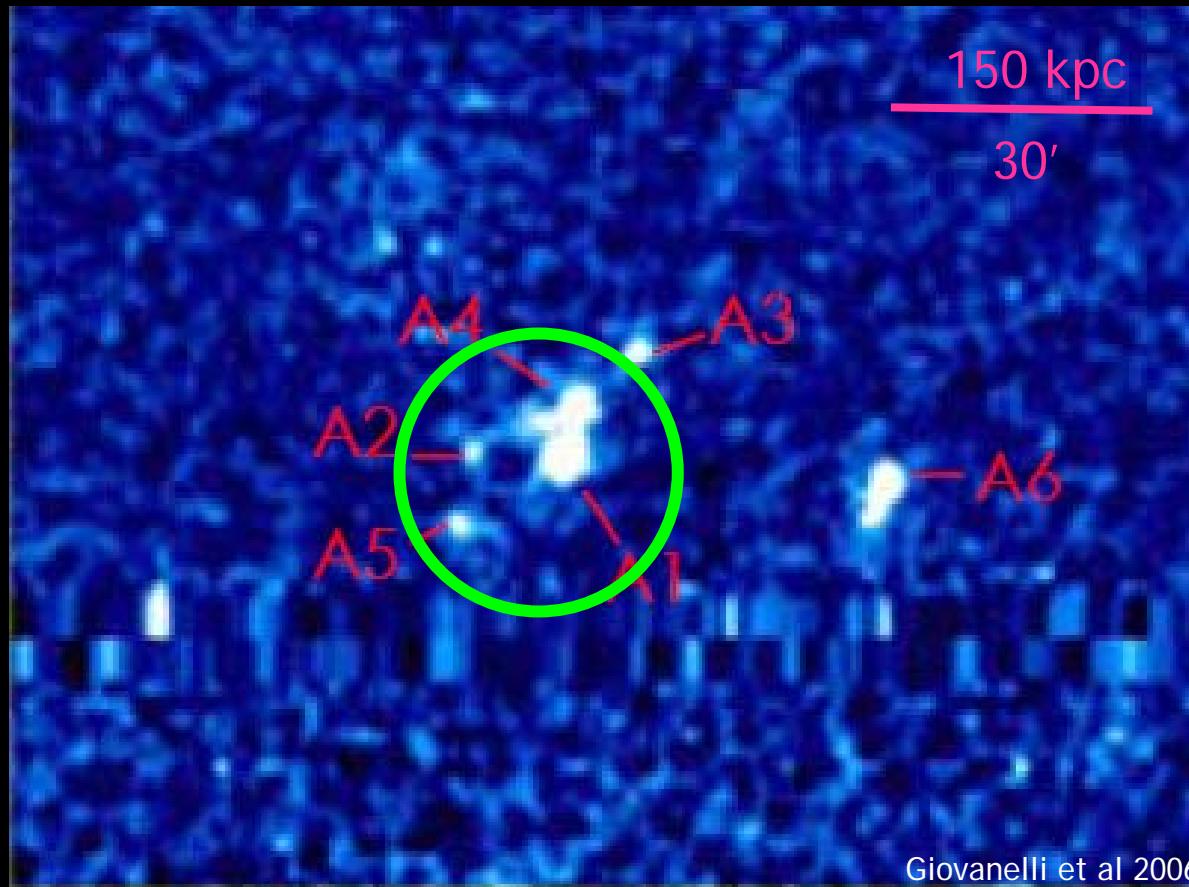
- cz ~ 450 km/s
- Disturbed H α , CO, HI
- Cortes et al. 2006:
int. mass merger + ram
pressure stripping

Cortes et al. 2006

$60''$
5 kpc

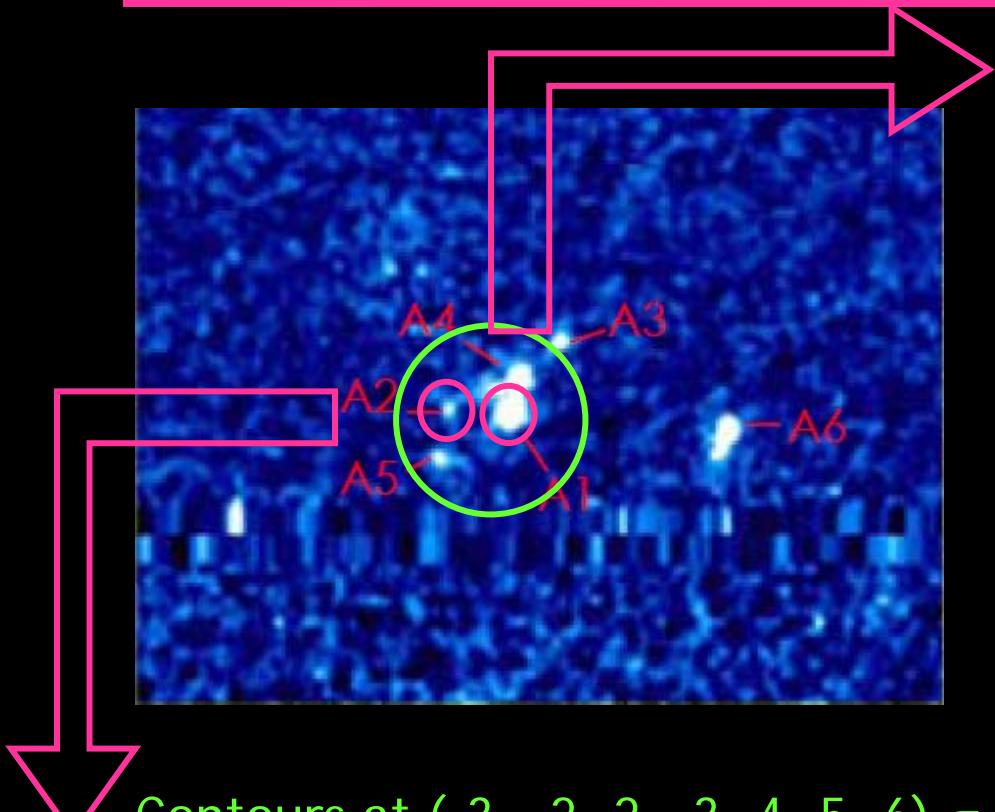
A New HI Complex in Virgo

ALFALFA Spring 2005 run:

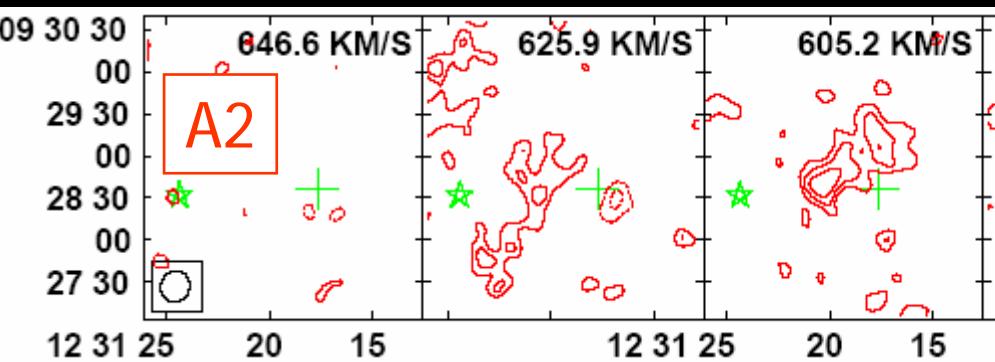
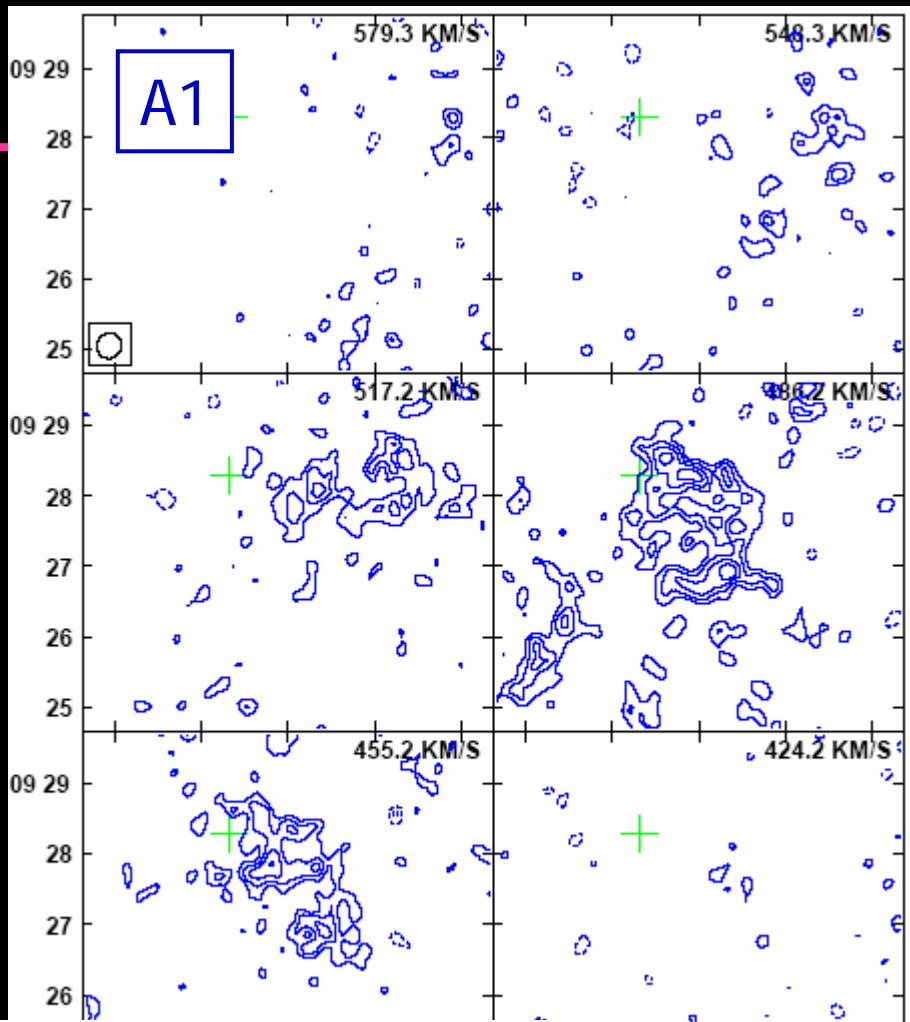


VLA observations: ~5 hours in C config, ~1 hour in D config

Detections

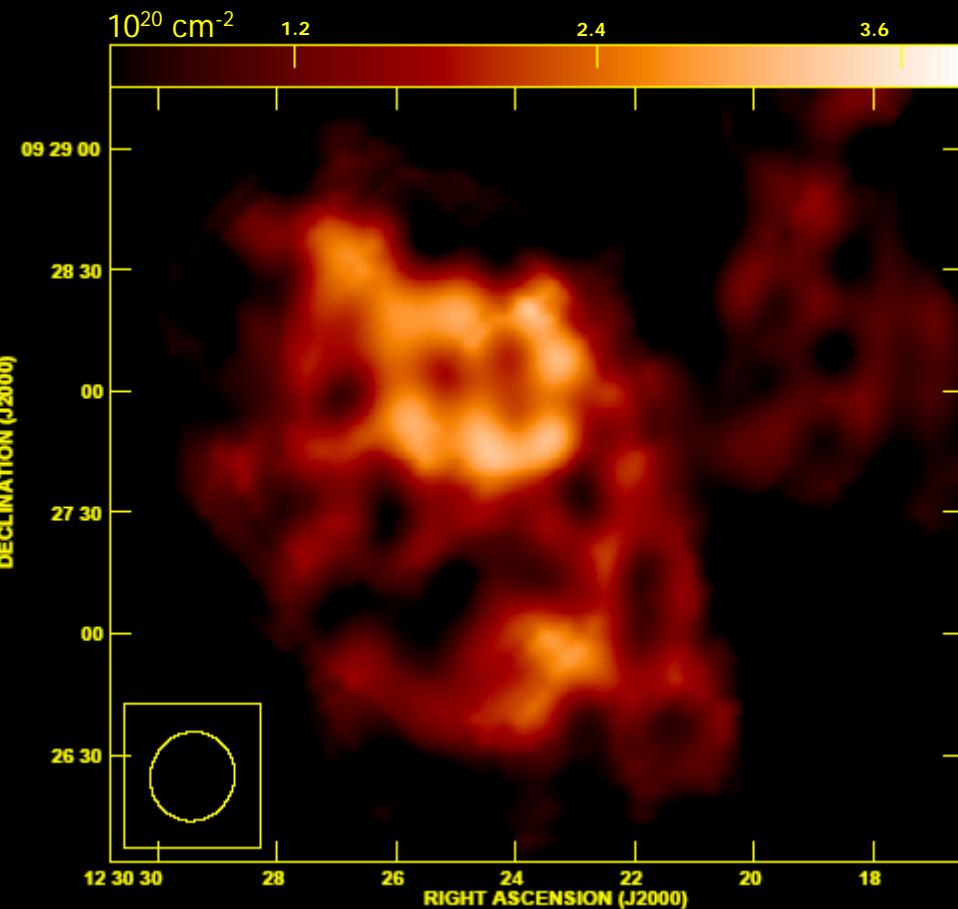


Contours at $(-3, -2, 2, 3, 4, 5, 6) \sigma$

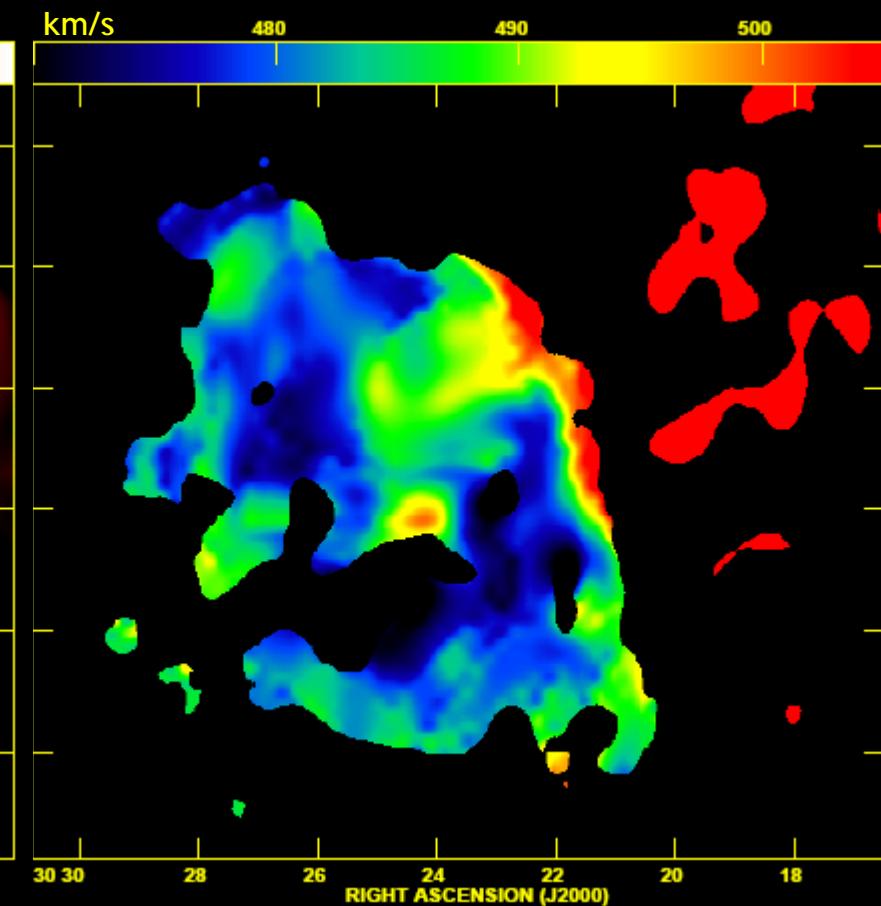


HI Morphology - A1

Total Intensity

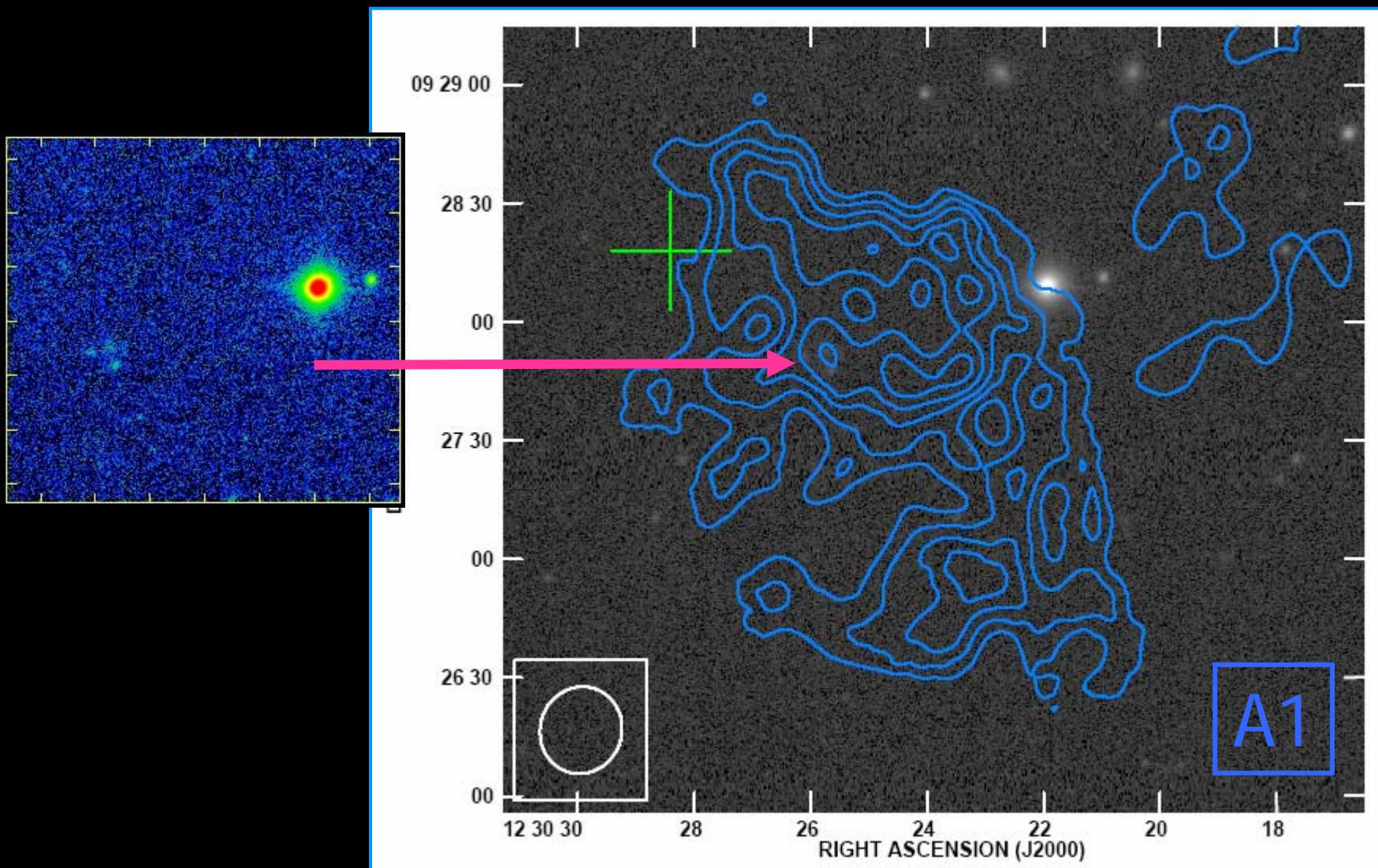


Intensity-Weighted Velocity



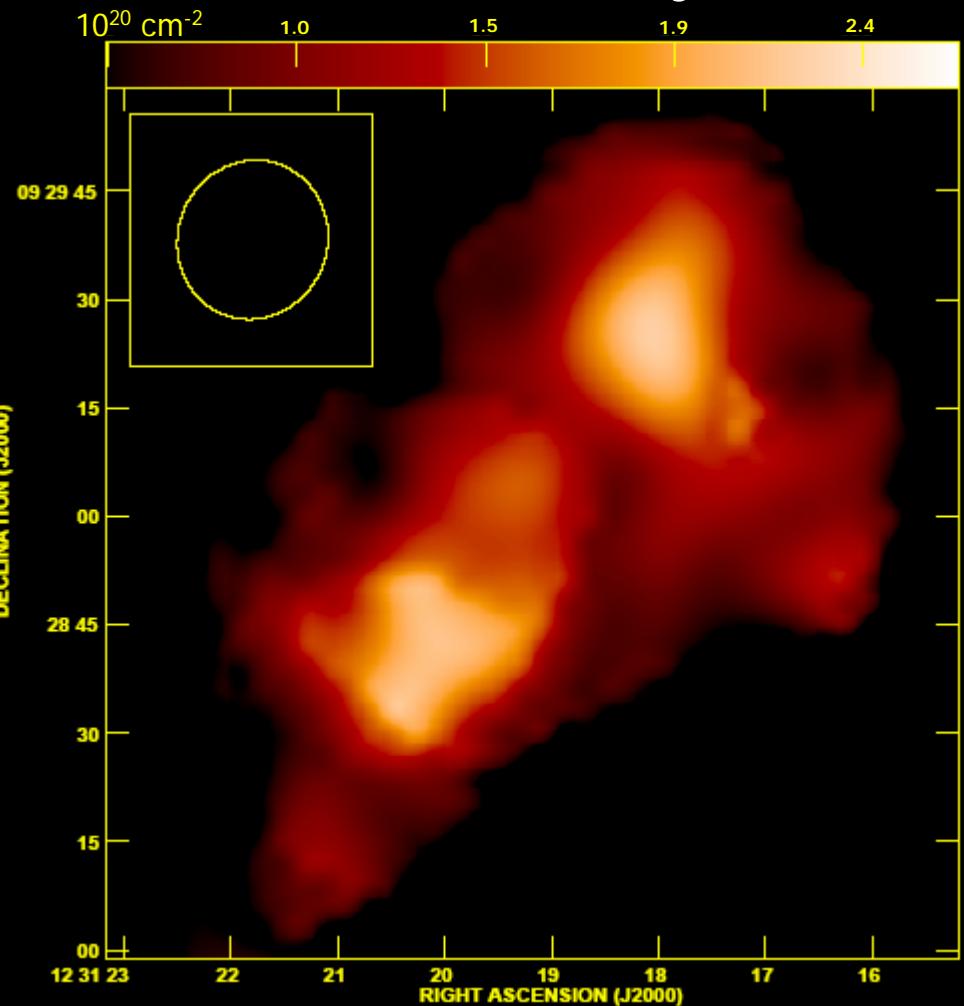
Clumpy emission, disordered velocities

HI Morphology - A1

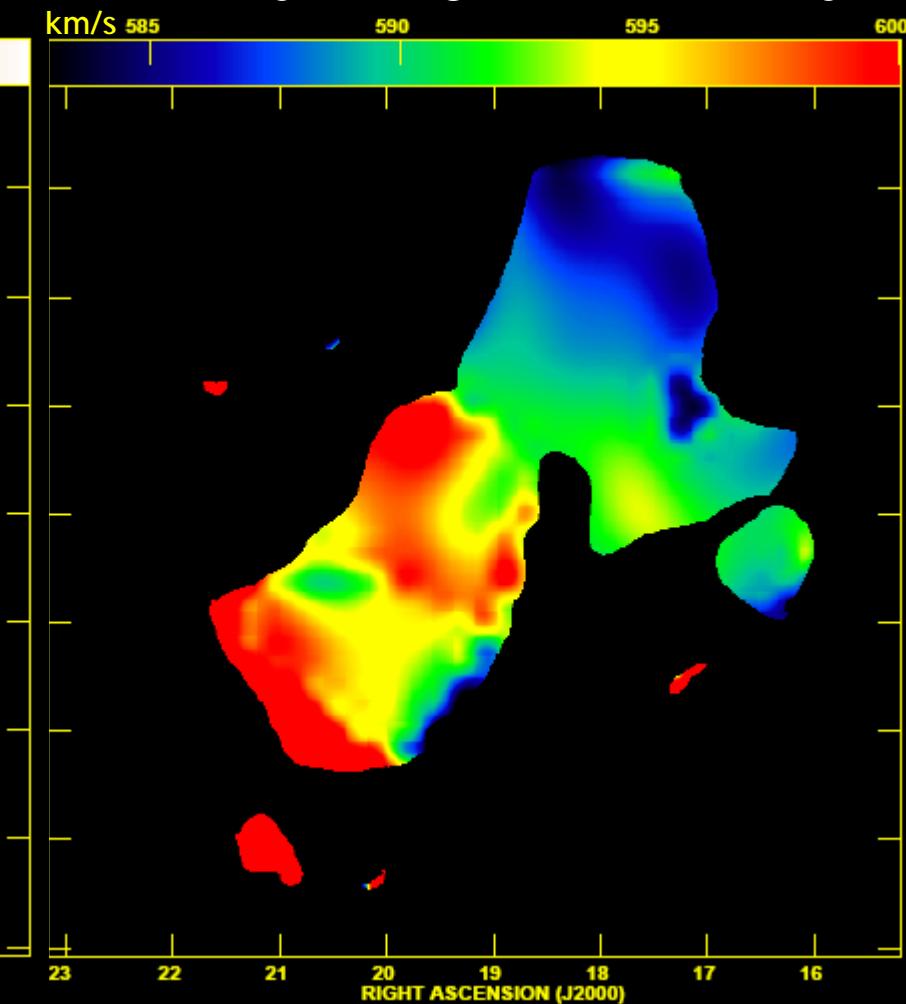


HI Morphology - A2

Total Intensity

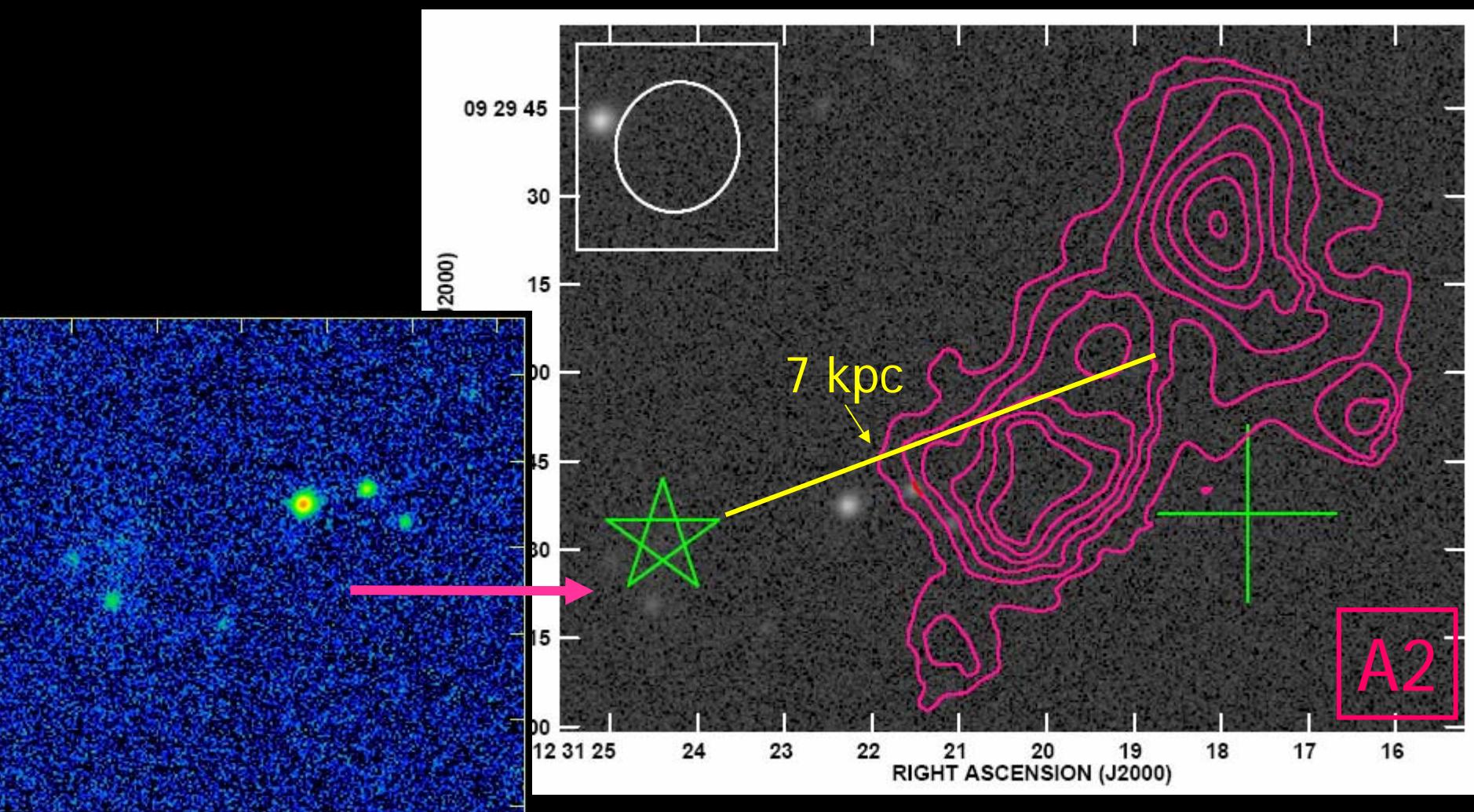


Intensity-Weighted Velocity

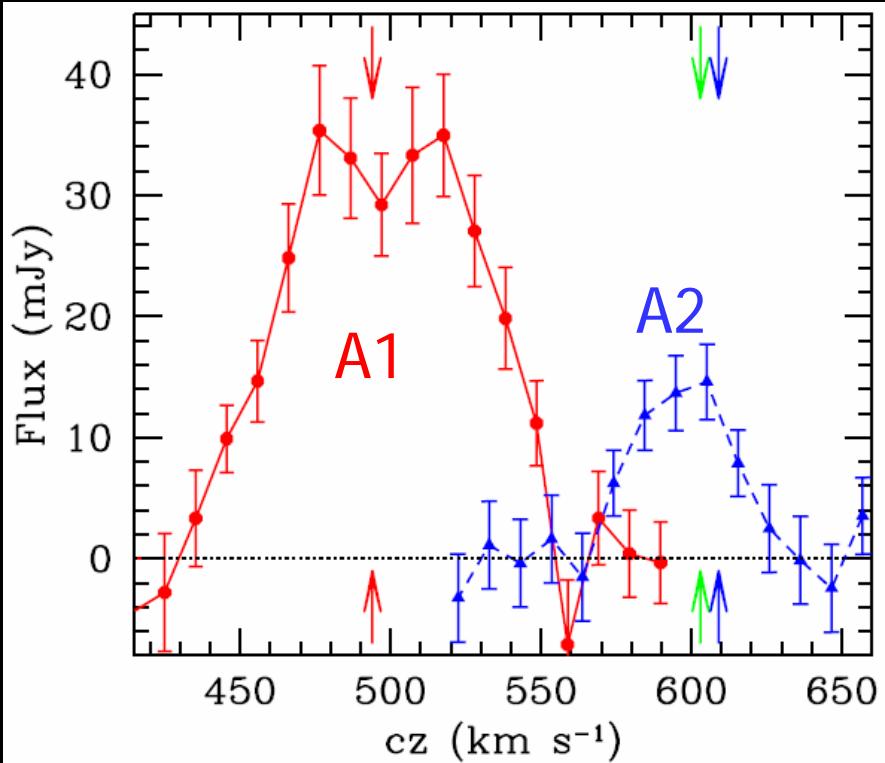


NW advancing, SE receding?

HI Morphology - A2

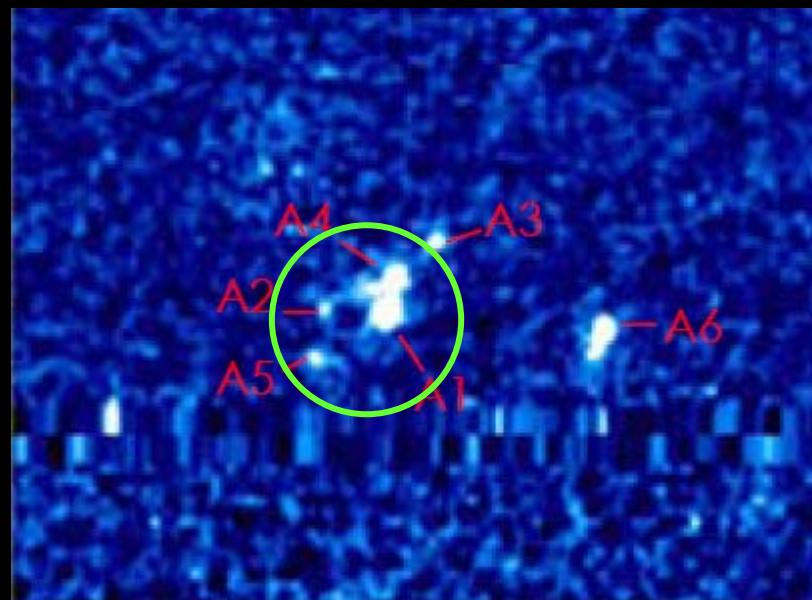


Global Properties



Property	A1	A2
cz, km/s	494 (AO) 496 (VLA)	602 (AO) 597 (VLA)
W ₅₀ , km/s	66±2 (AO) 72±13 (VLA)	45±9 (AO) 33±7 (VLA)
SdV, Jy km/s	3.9±0.4 (AO) 2.8±0.2 (VLA)	0.7±0.1 (AO) 0.6±0.1 (VLA)

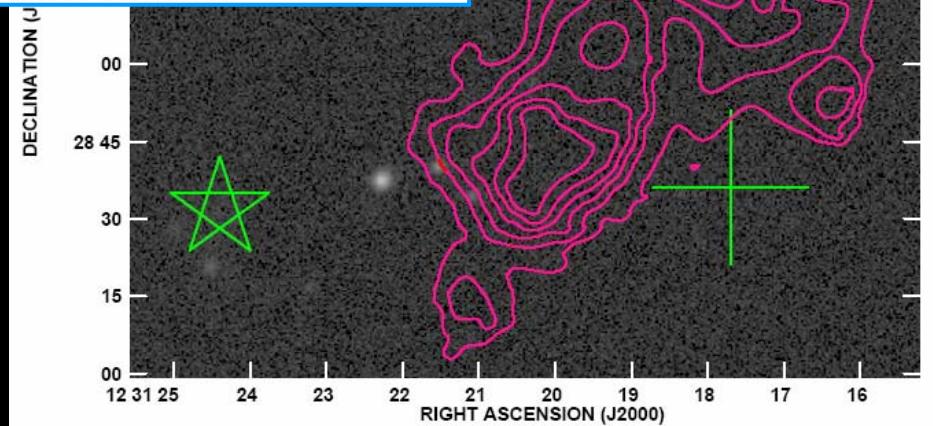
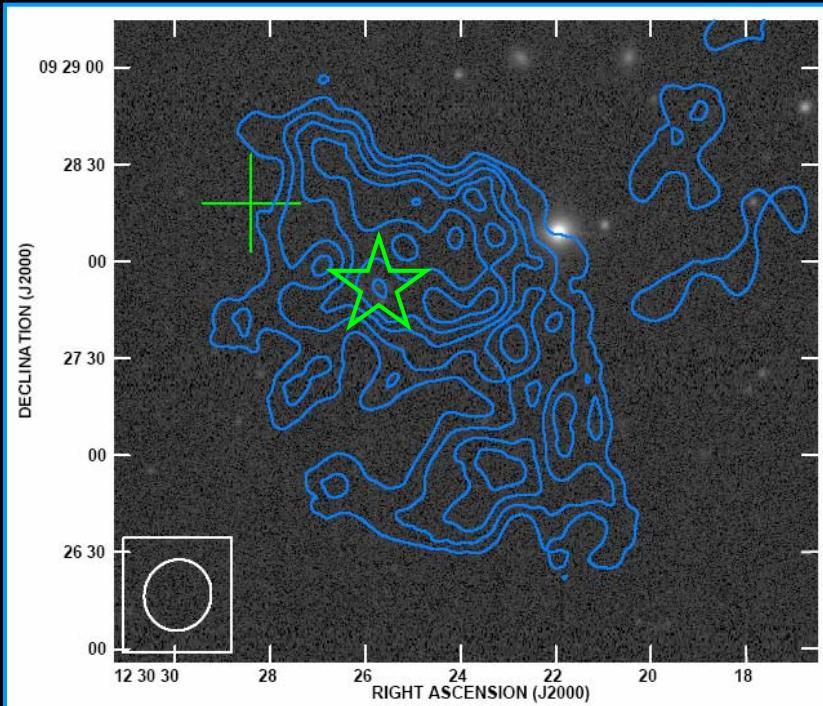
- Non-detections of A4, A5 expected if AO flux distributed over ~1.5 arcmin



What is it?

- Clumpy emission on scales >2 kpc ($>$ resolution limit)
- HI, CO in N4424 \rightarrow ram pressure stripping at work
(Cortes et al. 2006)
- 2 potential optical counterparts to VLA detections. In one, HI + optical separated by ~ 7 kpc: ram pressure?
- BUT: hard to explain morphologies with ram pressure alone
- Galaxy harassment scenario preferred

Ram Pressure Stripping Geometry



What is it?

- Complex HI mass exceeds that of any galaxy within few 100 kpc
- Clumpy emission, (mostly) disordered velocities on scales >2 kpc (> resolution limit)
- No clear connection with N4424 + disordered velocity structure = tidal int. unlikely
- HI, H α , CO in N4424 \rightarrow int. mass merger + ram pressure stripping (Cortes et al. 2006)
- 2 potential optical counterparts to VLA detections. In one, HI + optical separated by ~7 kpc
- Hard to consistently explain properties of all clumps via ram pressure
- Galaxy harassment scenario preferred

HI Follow-up: Lessons Learned

1. Arecibo is sensitive

- Huge collecting area
- Scales > few arcmin resolved out by VLA

2. Virgo is big

- Multiple pointings + configurations necessary

Coherent, large follow-up VLA proposal might maximize telescope time/science returns

