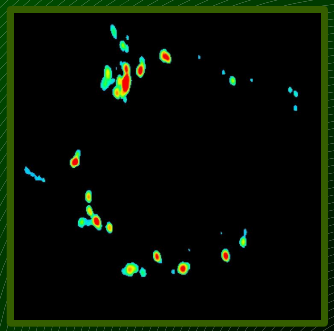
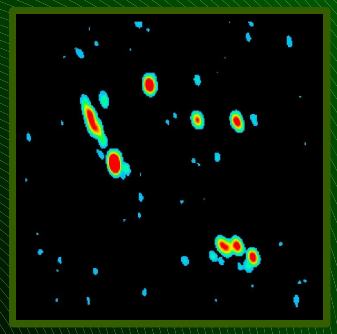
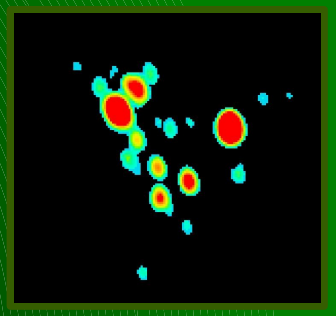

New morphologies of 6.7 GHz methanol masers

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and

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Consortium for Very Long Baseline Interferometry in Europe

Introduction:

Methanol maser emission at 6668.518 MHz:

1) traces the early stages of massive star formation,

2) probes the environment at small scales (~5 AU) very close to the protostar (~1000 AU),

3) shows different morphologies.

Our aim: To image the homogeneous sample of 31 masers discovered in Torun blind survey and positioned with MERLIN (Cm-Mk) and find out where and when the emission arises (increased sensitivity at EVN).

Observations: phase-referenced, bandwidth 2MHz,

33 maser sites (+2 - Walsh et al. 1998, Beuther et al. 2002)

Run	Date	Durations	Telescopes
1	Jun 2003	12 hrs	4
2	Nov 2004	12	8
3a	Feb 2006	10	8
3b	Feb 2006	10	7
4a	Jun 2007	10	9
4b	Jun 2007	10	9
4c	Jun 2007	10	8

Results: rms=3-12 mJy/beam, beam ~5mas x16mas

1) imaged 31 out of 33 masers,

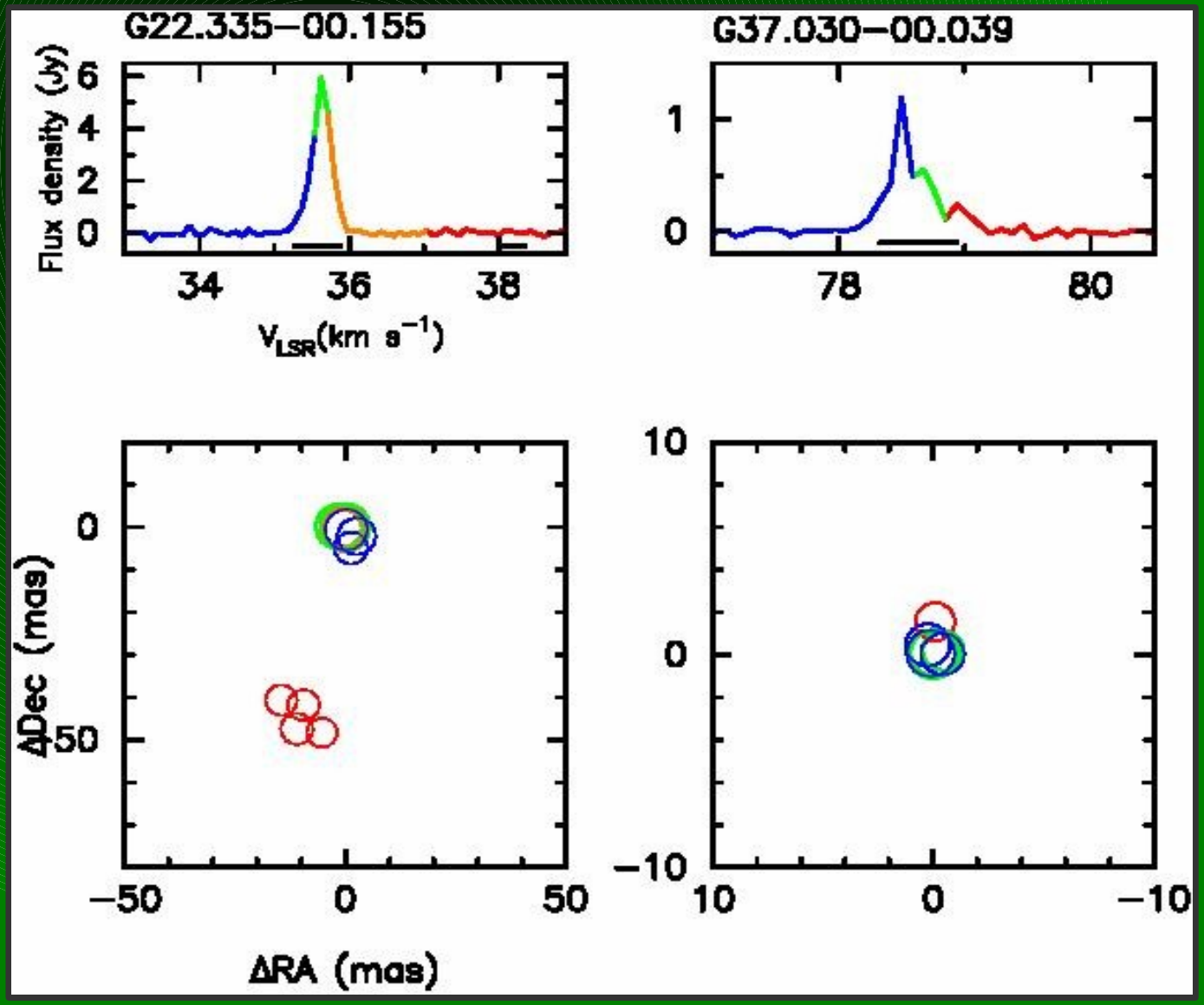
2) known absolute positions towards 29 sources,

3) 1936 maser spots registered,

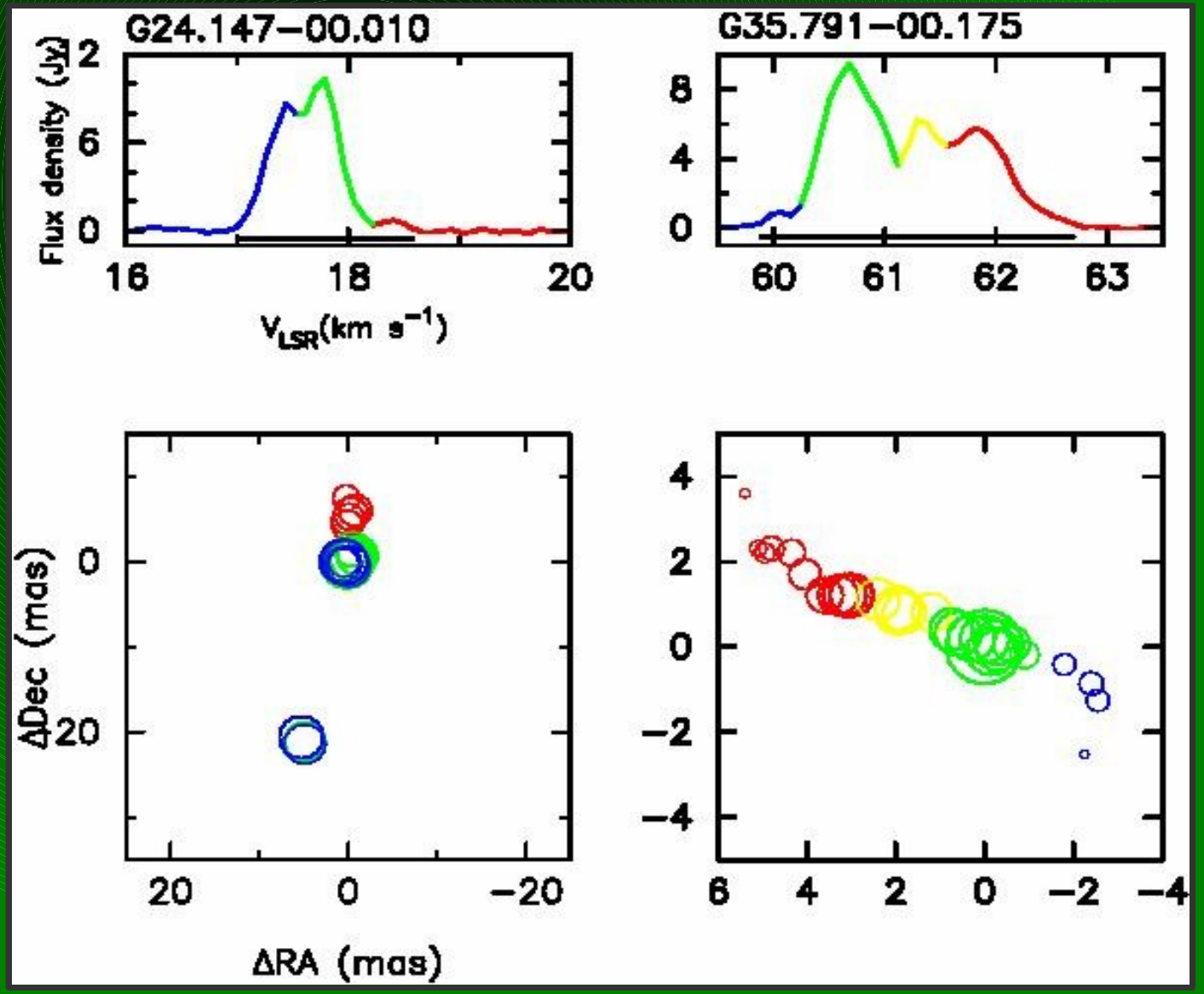
4) 318 maser clusters: 265 (83%) with Gaussian profile: mean FWHM=0.41 (+/-0.01) km/s.

Morphology ->

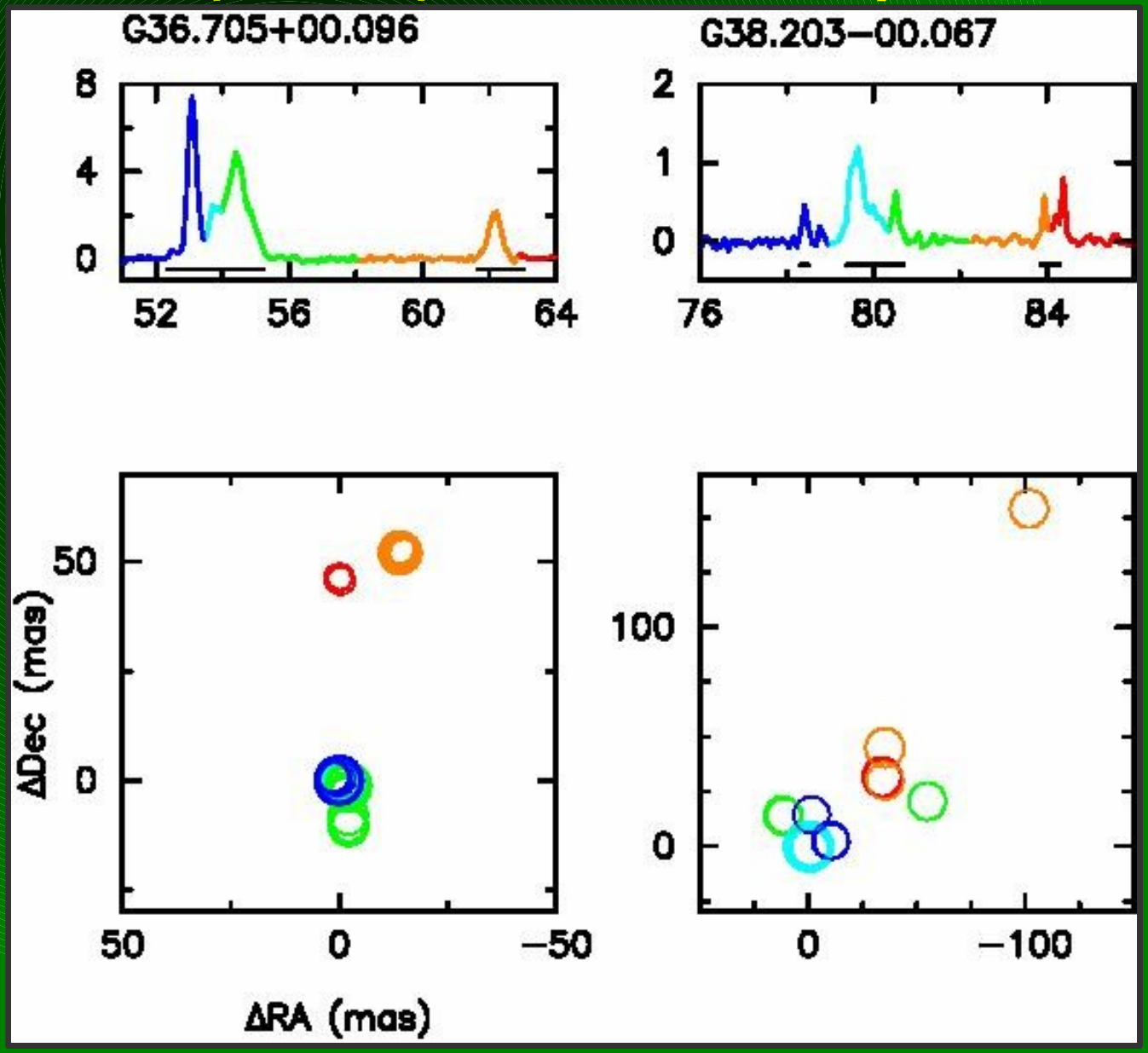
3 (9.5%) masers: *simple*



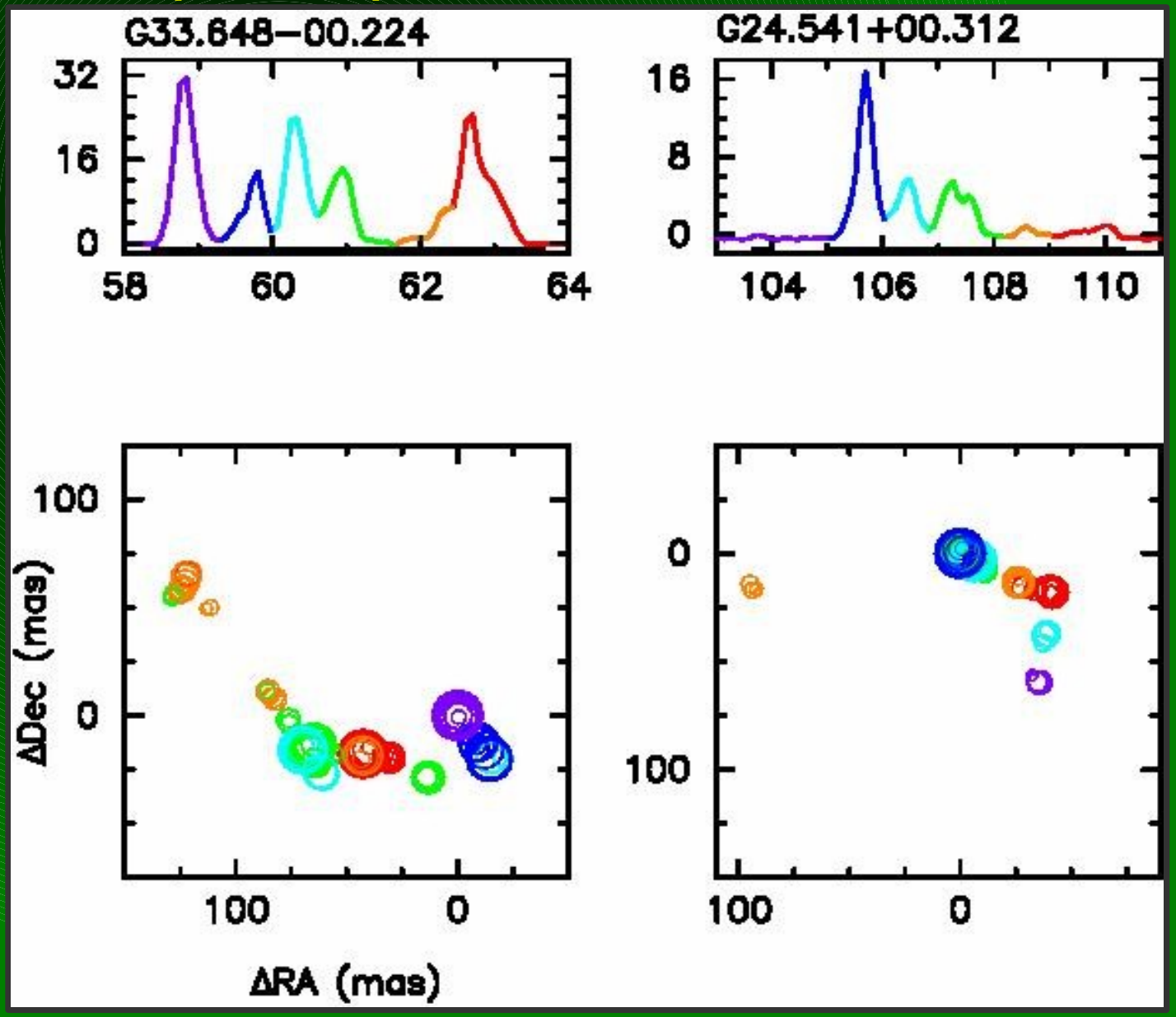
3 (9.5%) masers: *linear*



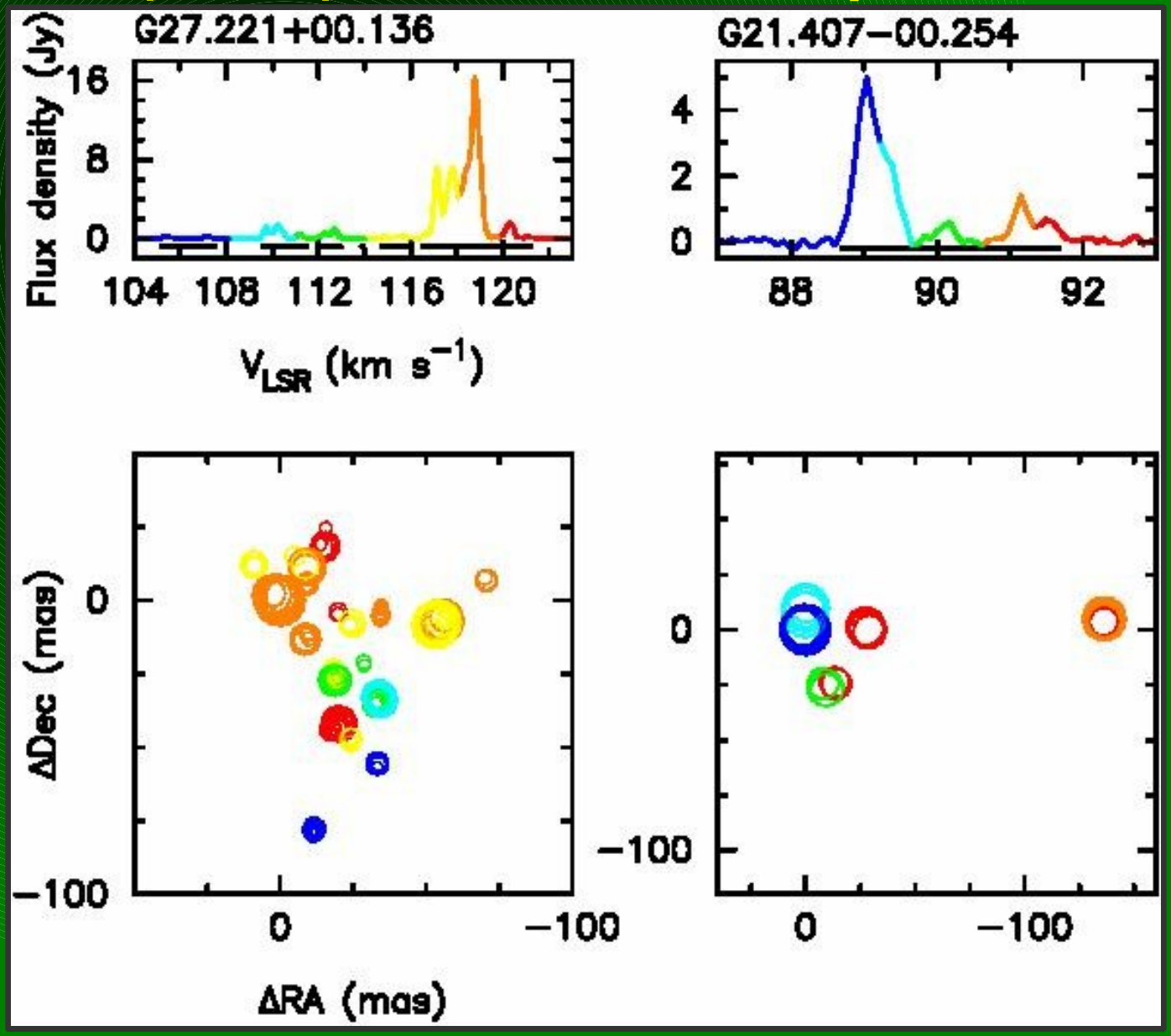
2 (6.5%) masers: *triple*



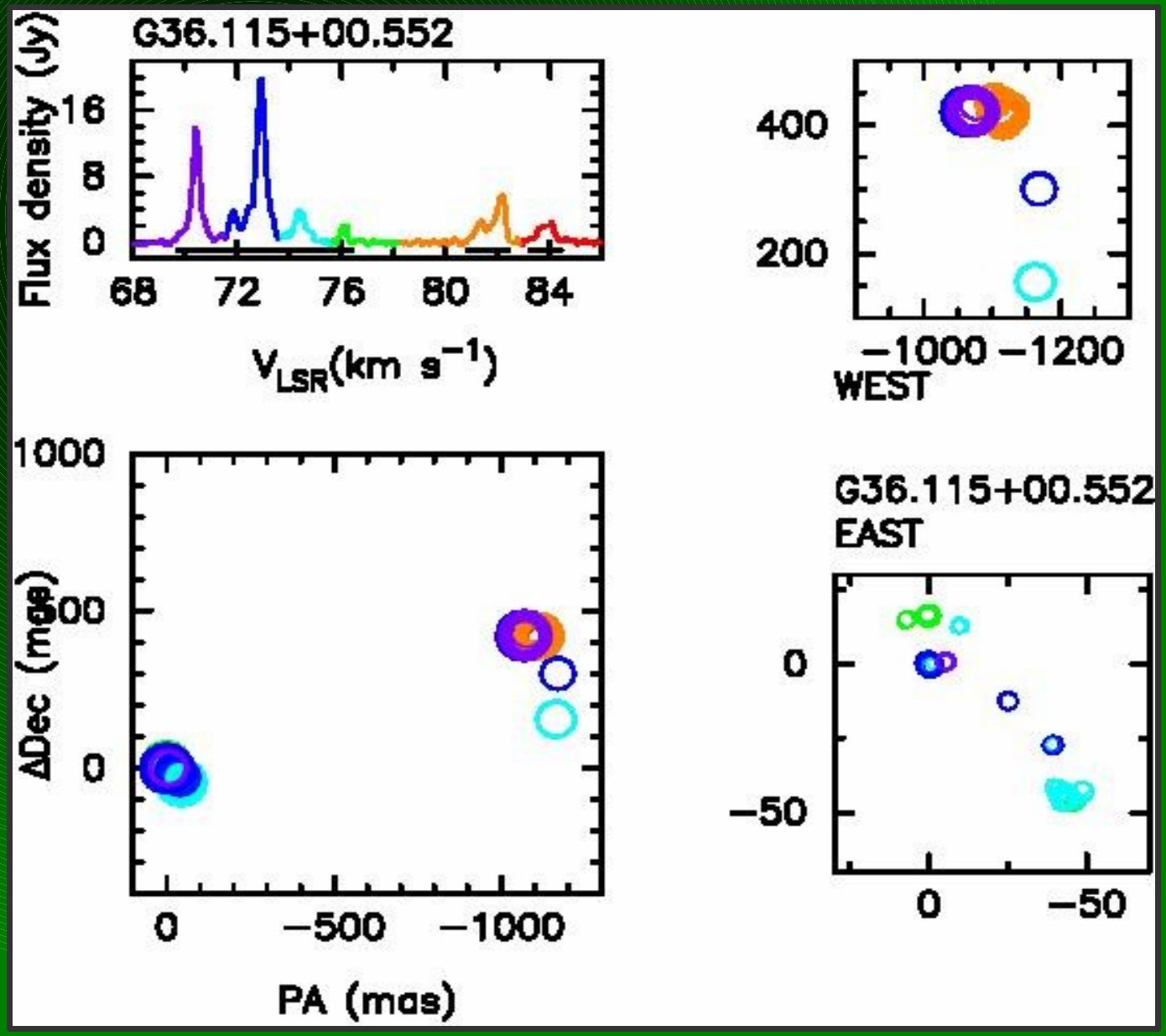
3 (9.5%) masers: *arc-like*



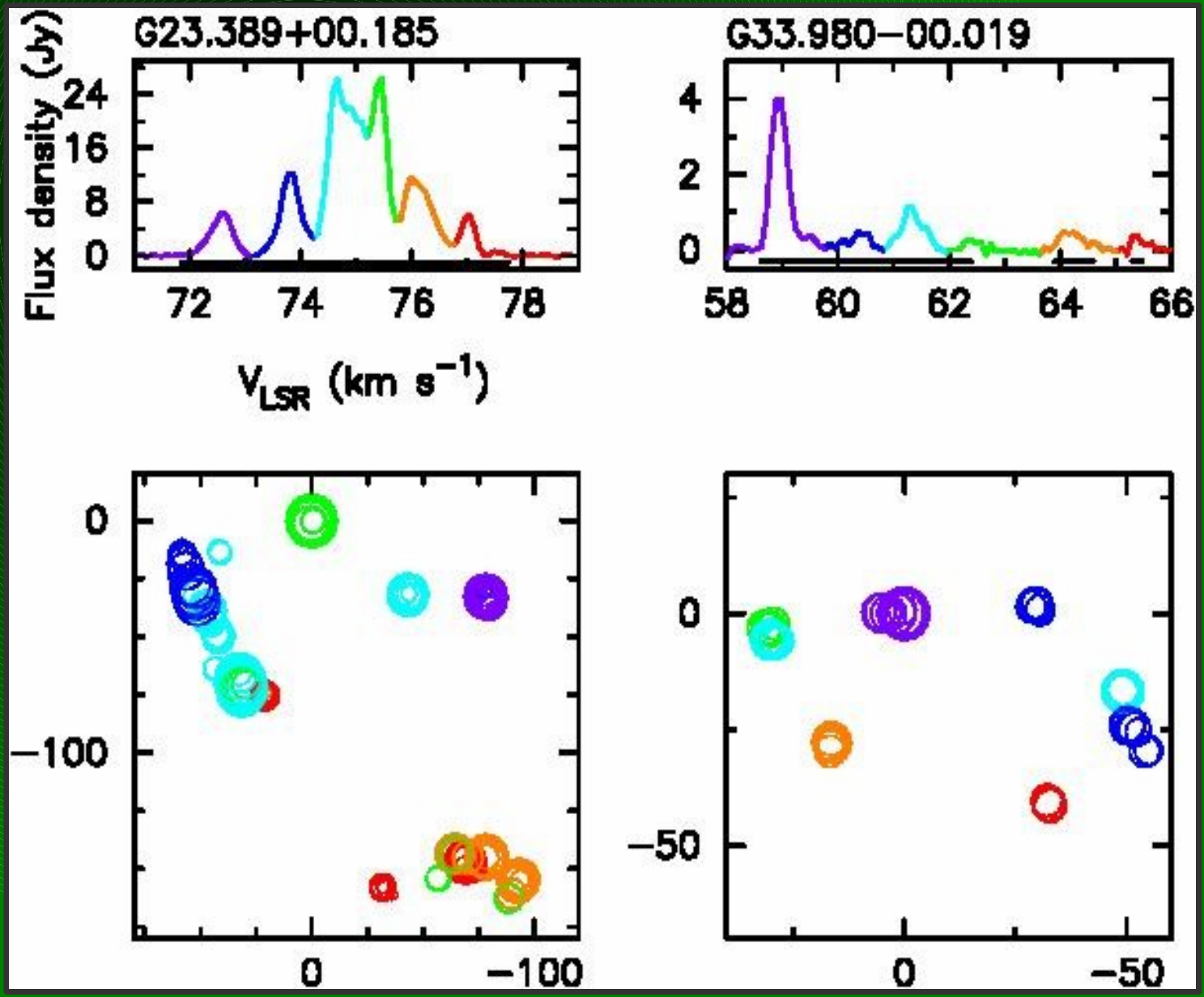
7 (23%) masers: *complex*



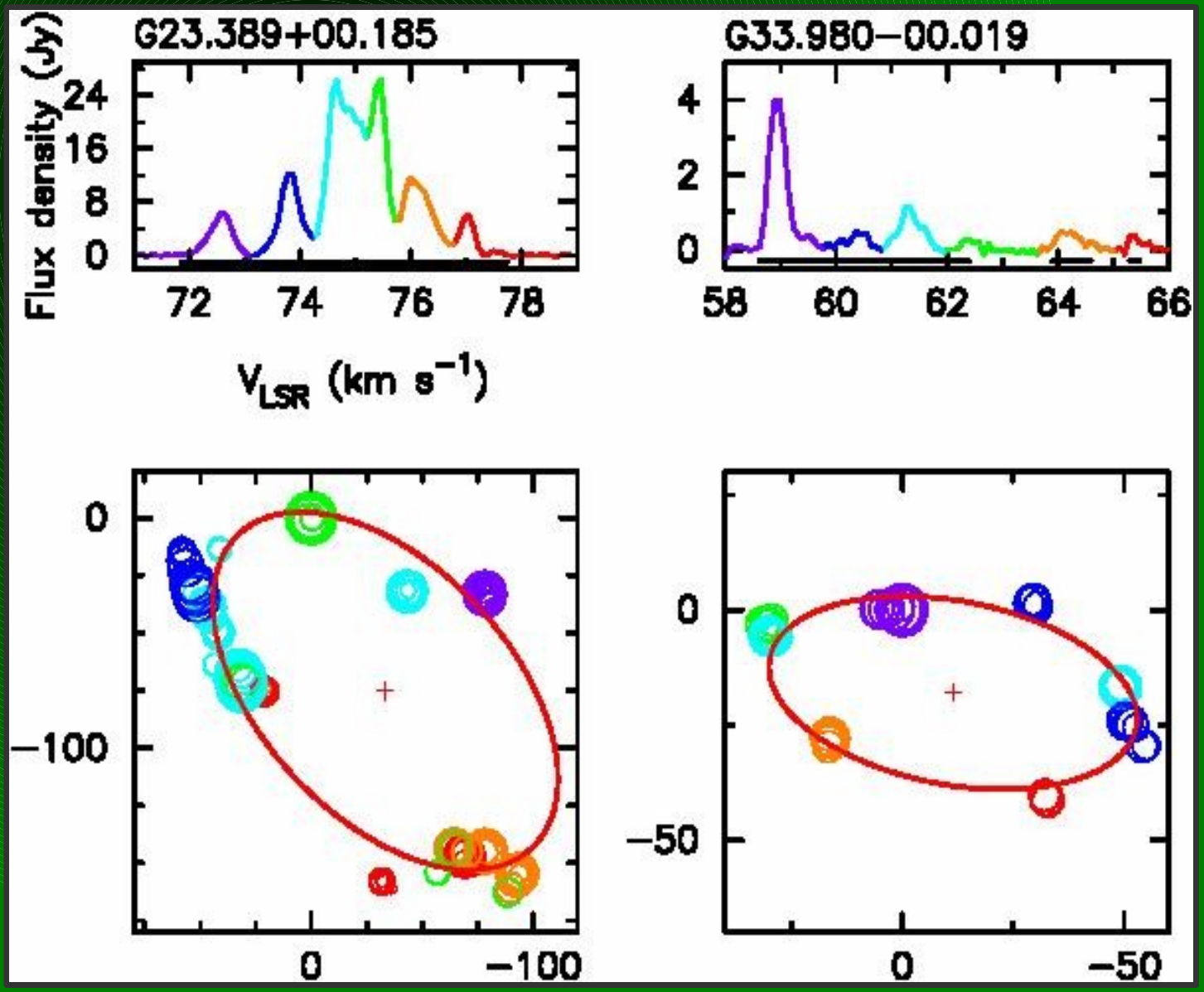
1 (3%) maser: *pair*



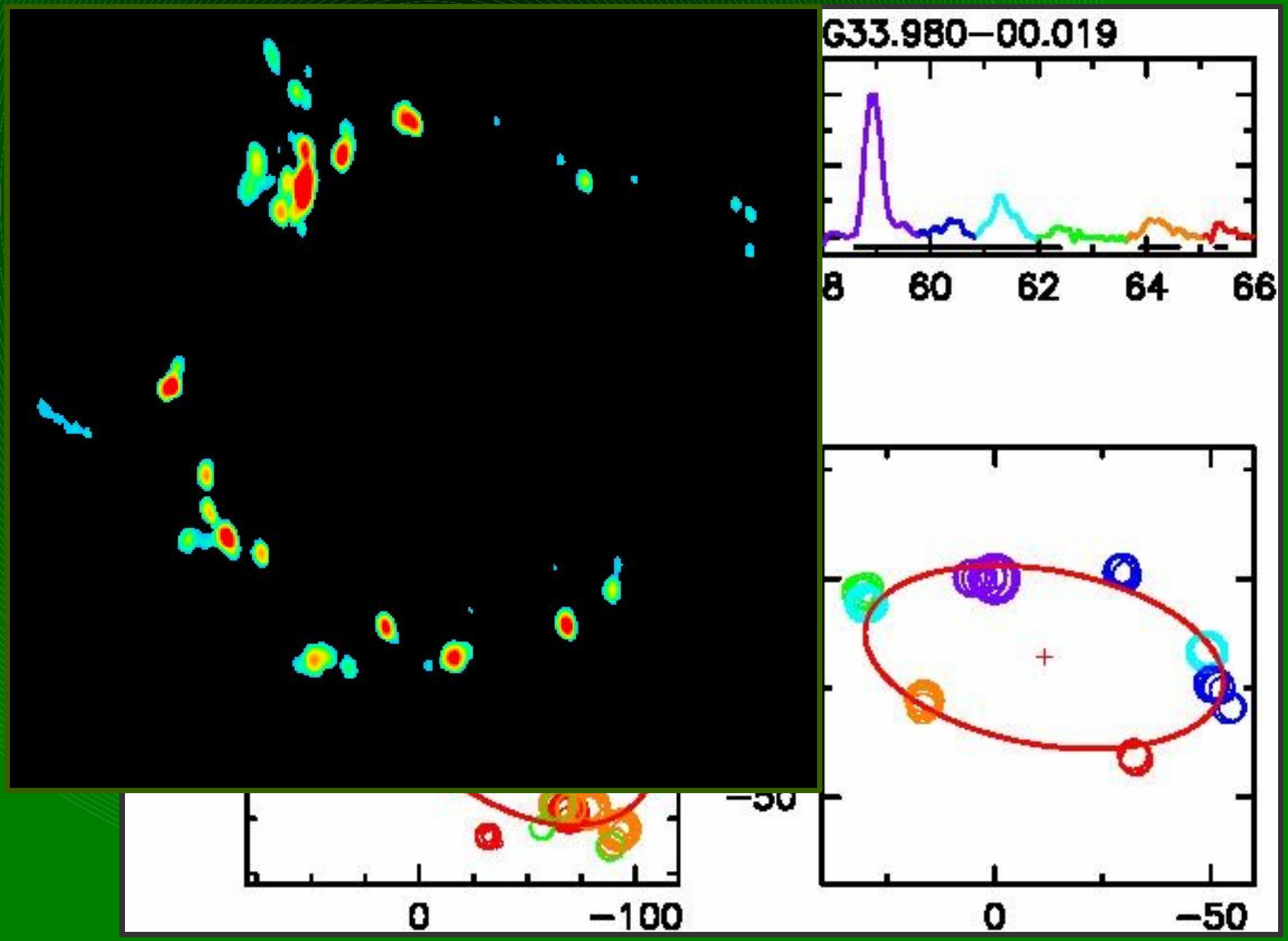
12 (39%) masers: *elliptical*



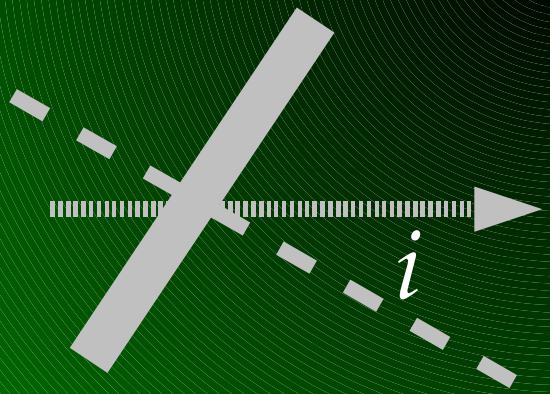
12 (39%) masers: *elliptical*



12 (39%) masers: *elliptical*



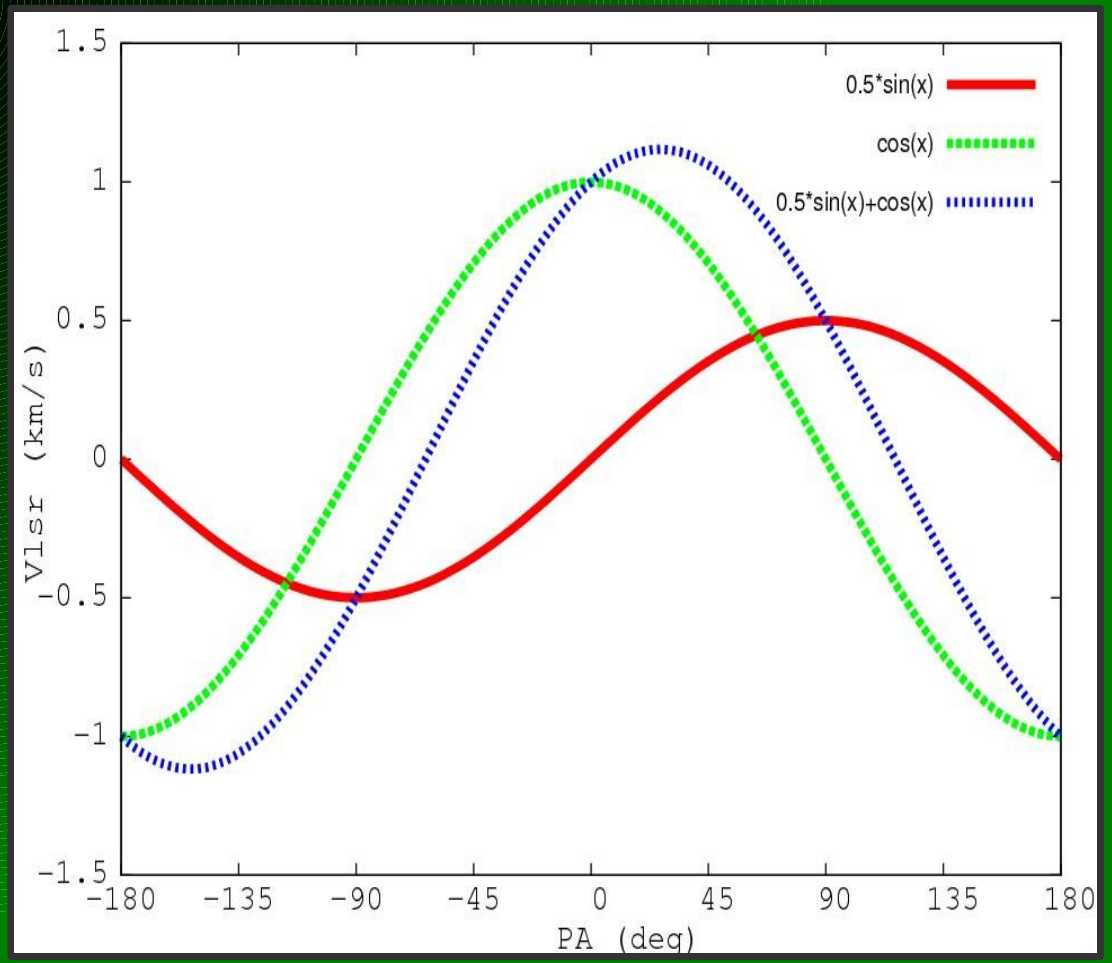
Model: rotating & expanding ring (Uscanga et al. 2008, Torstensson *soon*)



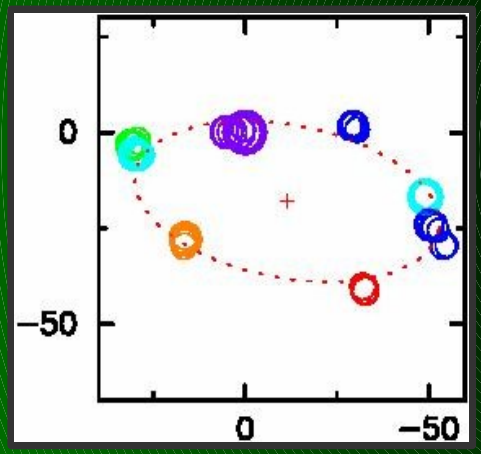
Vrot

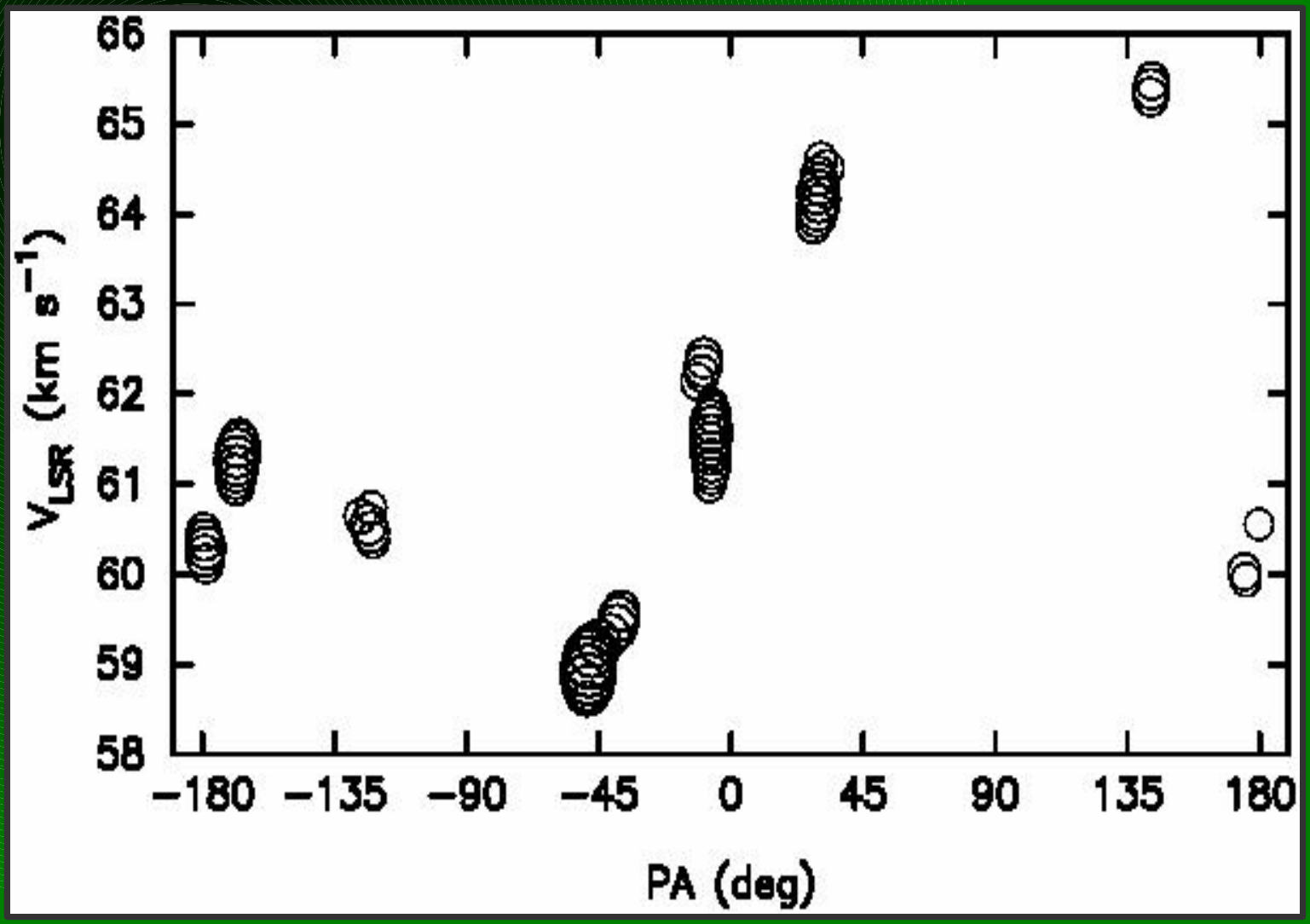
Vexp

Vobs



Model & data: G33.980-00.019



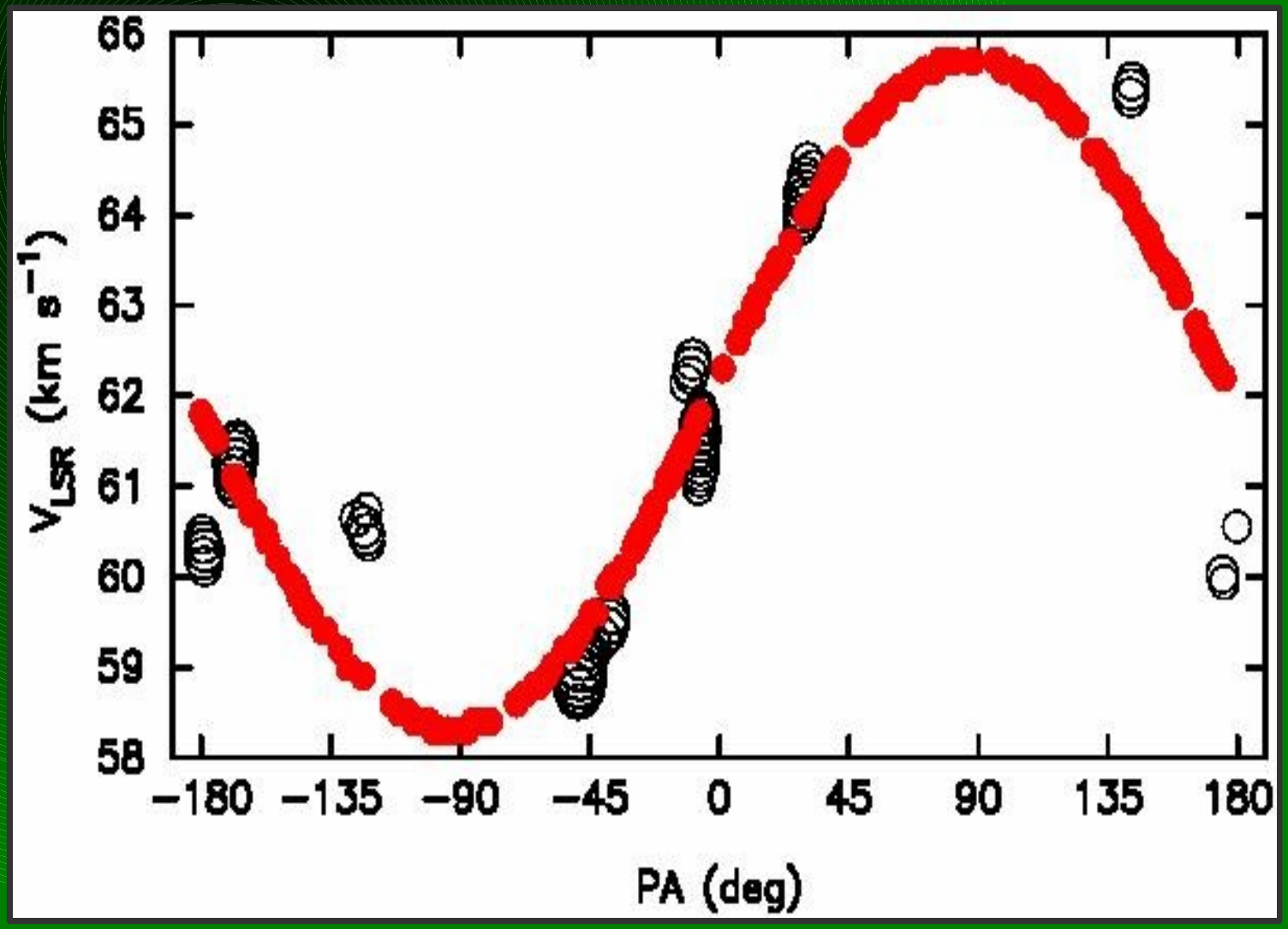


Model & data: G33.980-00.019

Vrot=0.2

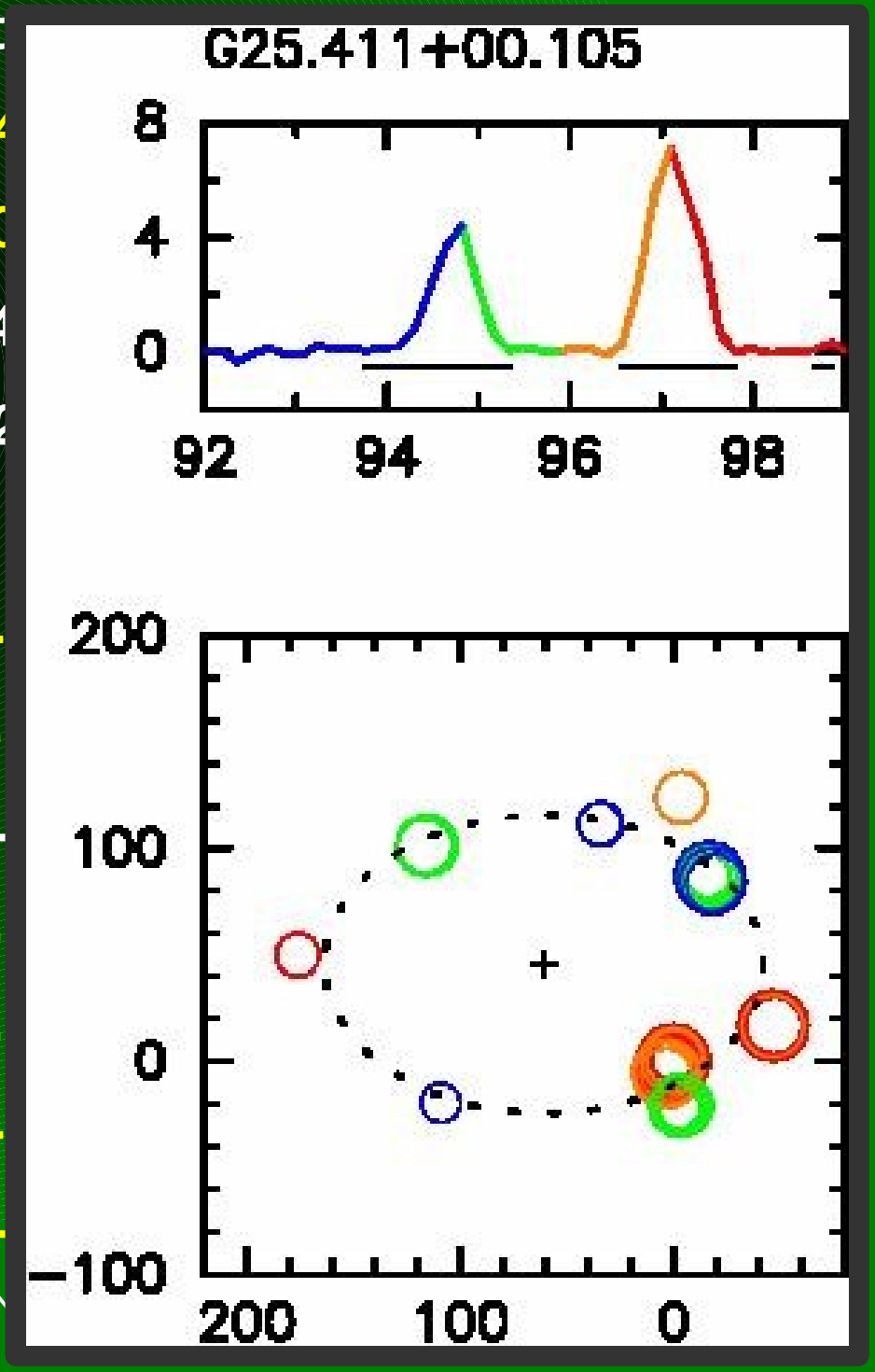
Vexp=4.2

km/s



NAME	Vrot	Vexp	Vsys	i(deg)
G23.207-00.377	1.4	5.8	79.5	-69.1
G23.389+00.185	-1.0	2.0	75.1	54.3
G23.657+00.127	7.4	4.2	81.6	-15.8
G24.634-00.324	6.2	1.0	39.5	-70.5
G25.411+00.105	0.0	1.6	95.8	47.2
G26.598-00.024	0.8	1.2	24.6	54.6
G28.817+00.365	-2.6	4.2	89.8	-70.0
G30.400-00.296	-2.8	0.6	101.3	-69.6
G31.047+00.356	-0.4	3.8	80.3	-60.5
G31.581+00.077	-1.0	1.6	98.5	-44.7
G33.980-00.019	0.2	4.2	62.0	61.6
G34.751-00.093	-0.4	2.8	51.3	-52.9

NAME	Vrot
G23.207-00.377	1.4
G23.389+00.185	-1.0
G23.657+00.127	7.4
G24.634-00.324	6.2
G25.411+00.105	0.
G26.598-00.024	0.
G28.817+00.365	-2.
G30.400-00.296	-2.
G31.047+00.356	-0.
G31.581+00.077	-1.
G33.980-00.019	0.
G34.751-00.093	-0.



Conclusions:

1) better sensitivity ➞ new morphologies,

2) elliptical morphology - common,

3) ring (disc/torus) with rotation and outflow.