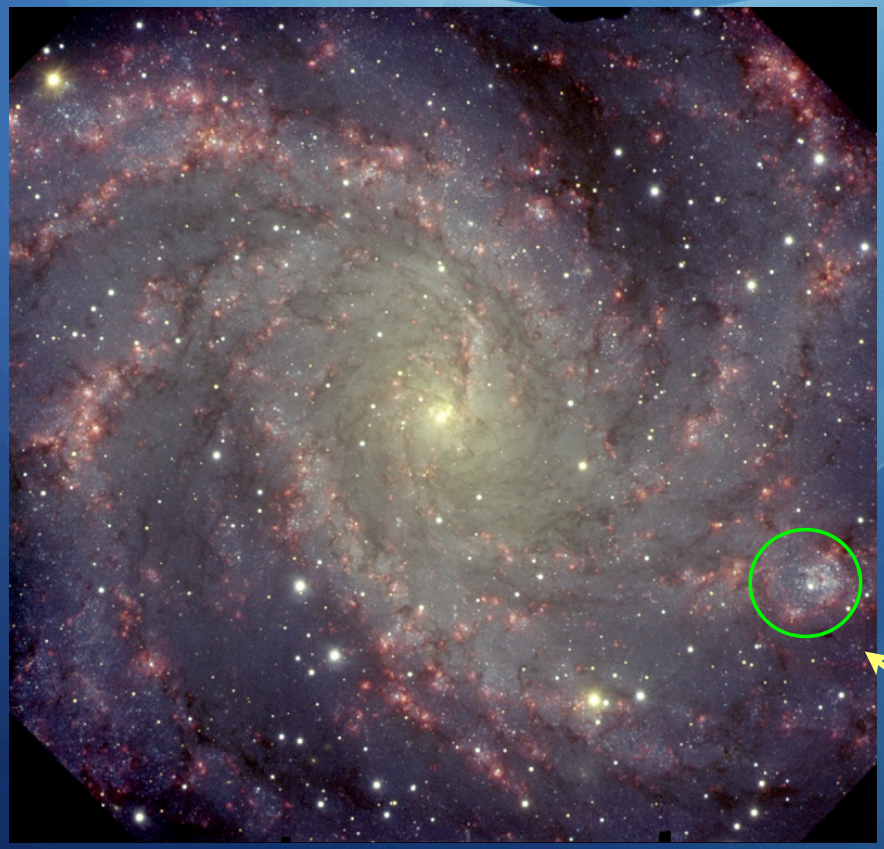
KINEMATICS OF GIANT STAR FORMATION REGIONS IN NGC 6946

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ESTALLIDOS DE FORMACIÓN ESTELAR EN GALAXIAS, IV MEETING

NGC 6946



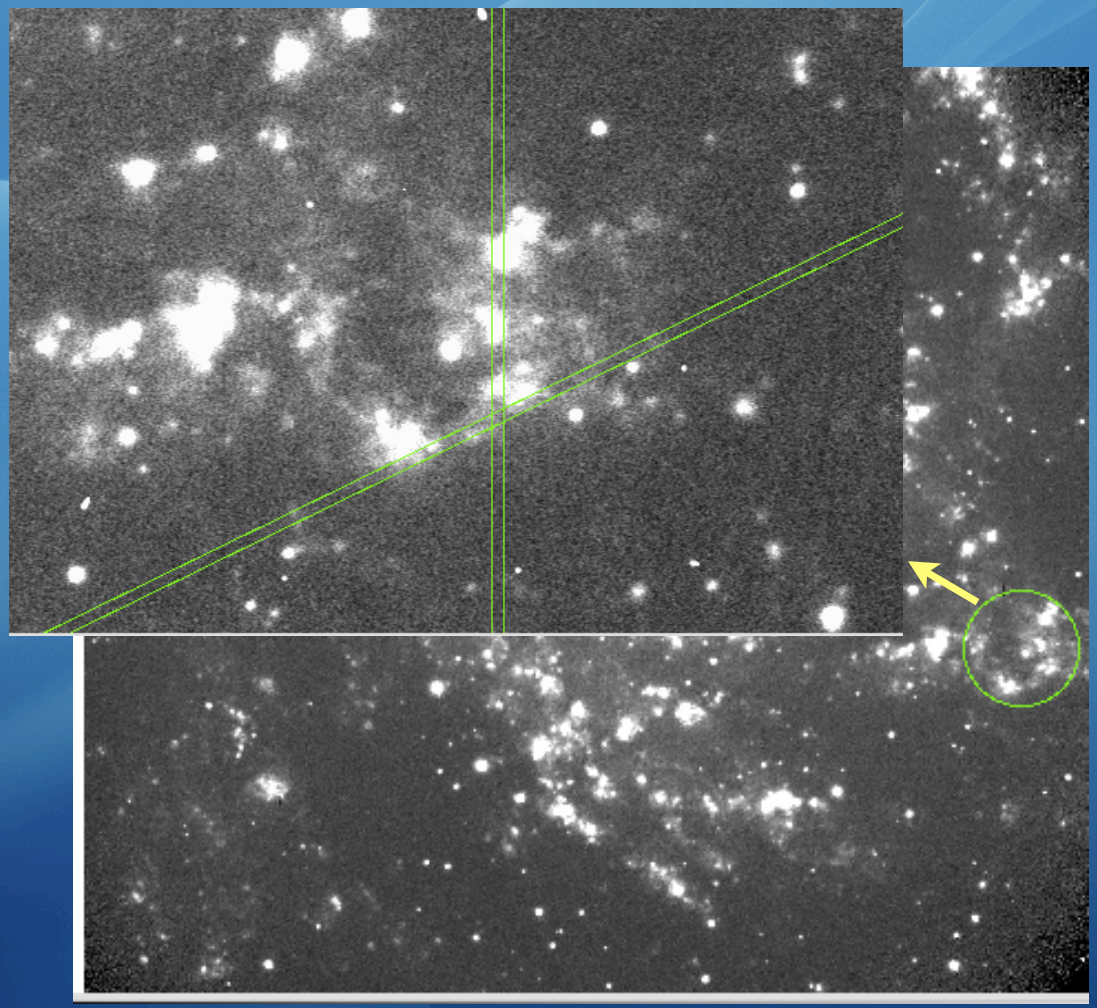
- Starburst galaxy, 6 Mpc from the Sun
- High star formation rate
- High density of star clusters, and highest number of observed SNs (8)
- Very massive and energetic High Velocity Clouds detected
- Several dwarf galaxies orbiting around it
- **A large,blue and bright star complex, 600 pc in diameter, at 5kpc SW from the center**

Data

- Set of spectra and images taken with the HST, and the WHT and NOT telescopes from Observatorio del Roque de los Muchachos, at La Palma
- Slit width 1 arcsec, spatial sampling 0.2 arcsec/ pixel
- Spectroscopy WHT+ISIS, blue and red arms, grating of 1200 lines/mm
- Two simultaneous wavelength ranges were taken centered at Hβ and Hα respectively, with a dispersion of 0.23Å/pixel

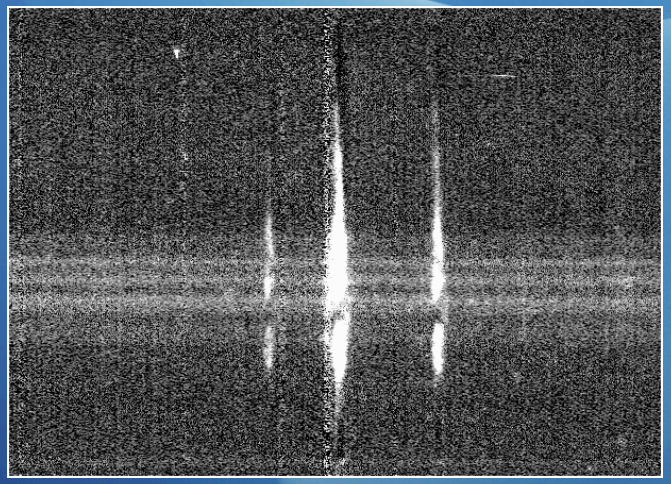
Slits

- Previous works and results : Efremov, Larsen et al ...
- Slits chosen next to the walls, in regions with highest Hα emission.



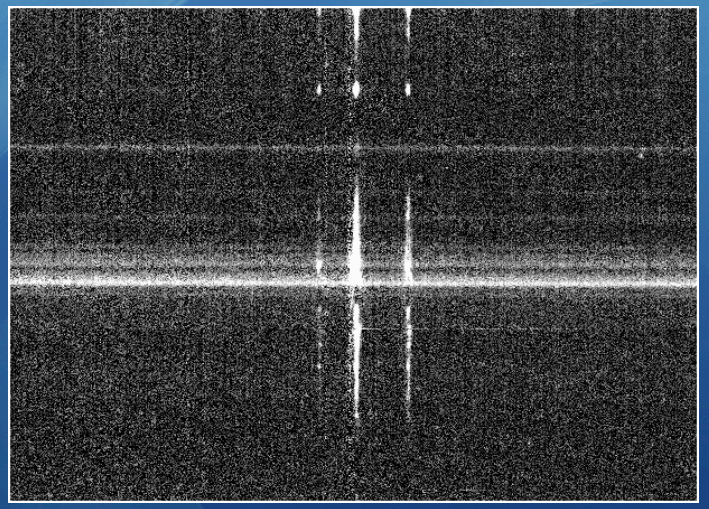
NOT telescope

Bidimensional spectra
(wavelength and spatial position)



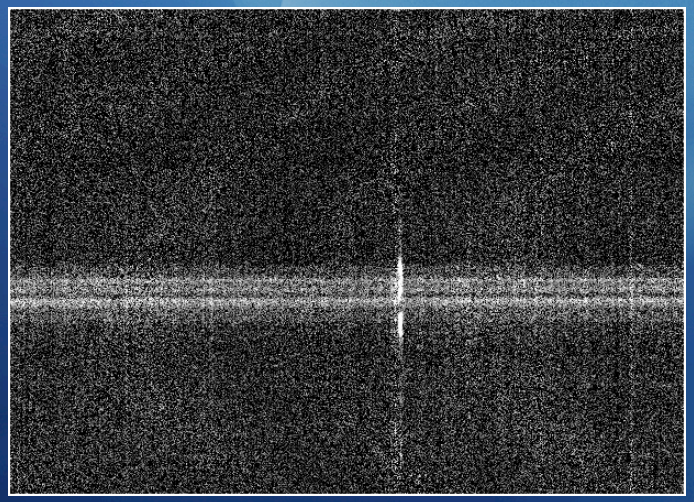
Red-0°

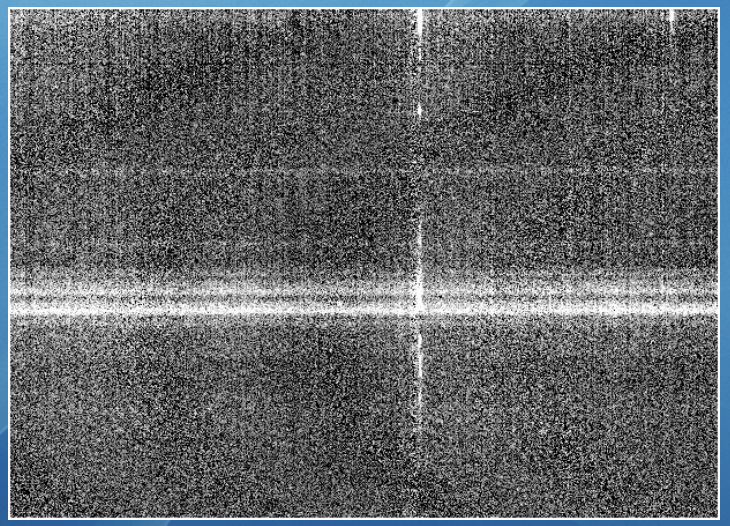
Red-296°



Bidimensional spectra
(wavelength and spatial position)

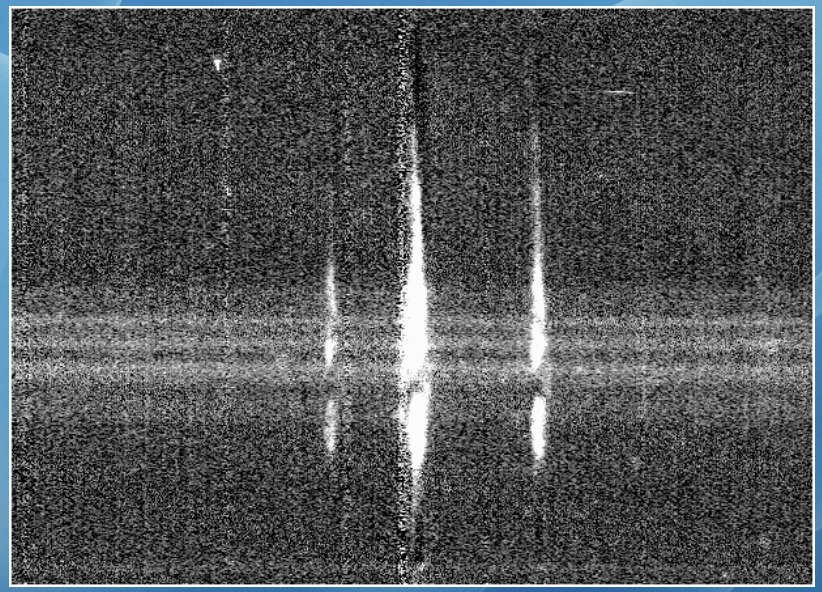
Blue-0°





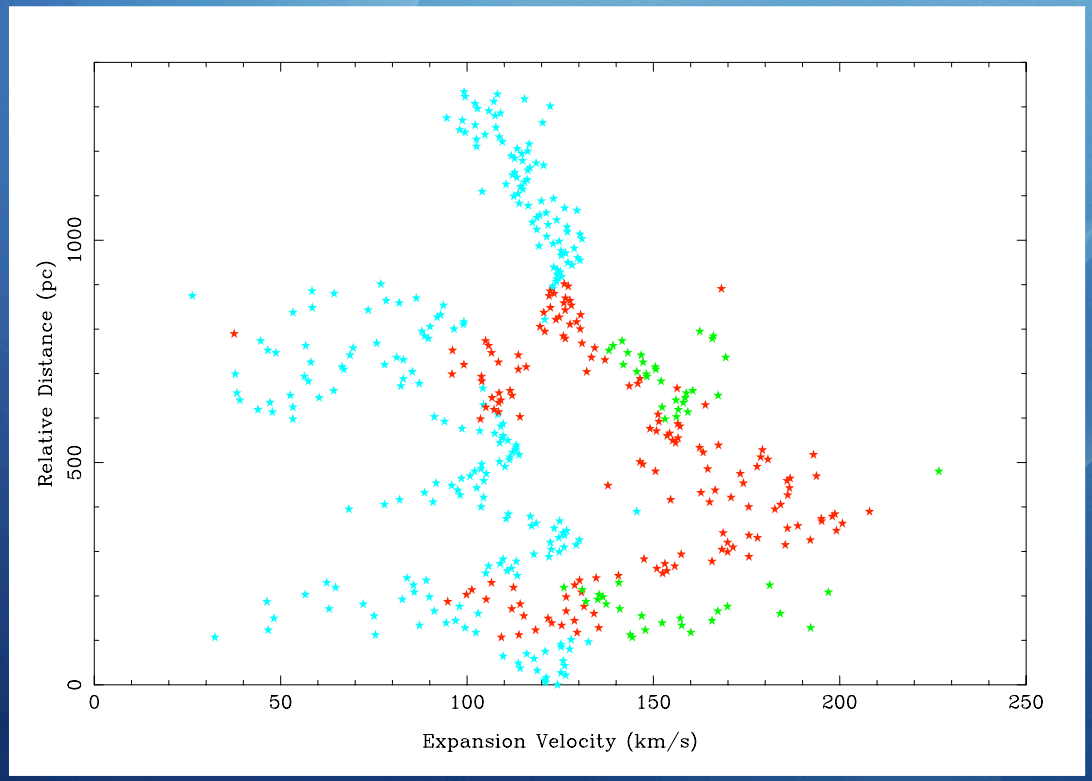
Blue-296°

Red-0°



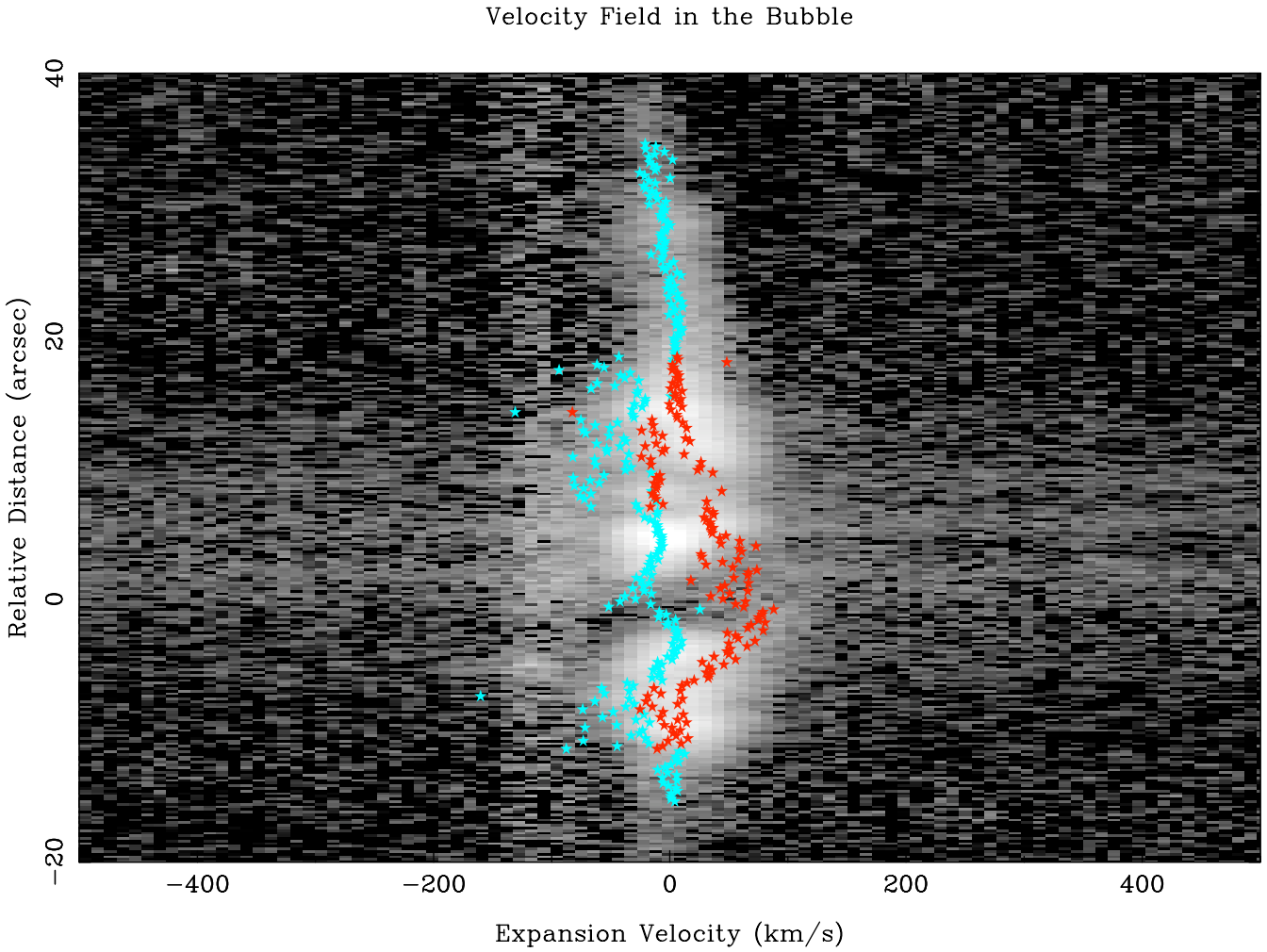
- Our first results come from the study of the bidimensional spectrum of the red arm, at slit position 0°.

Red-0°

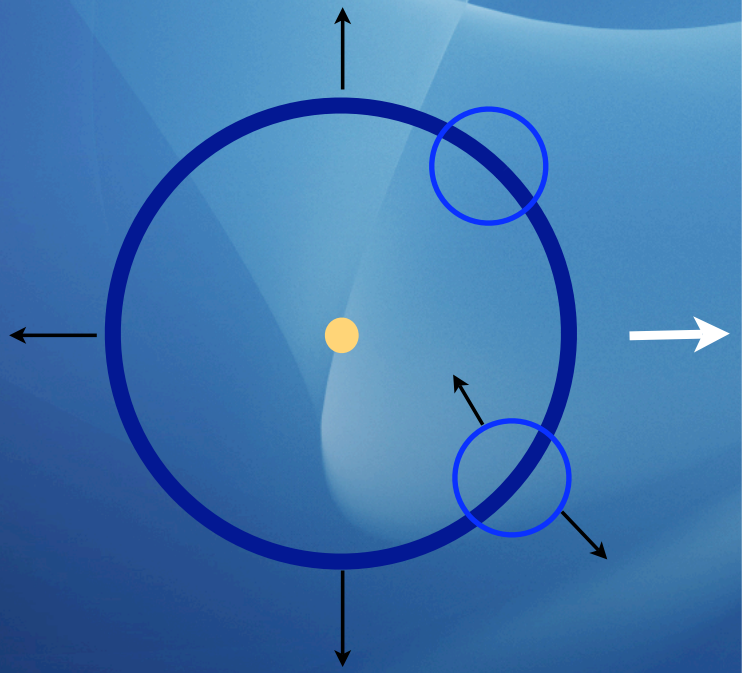


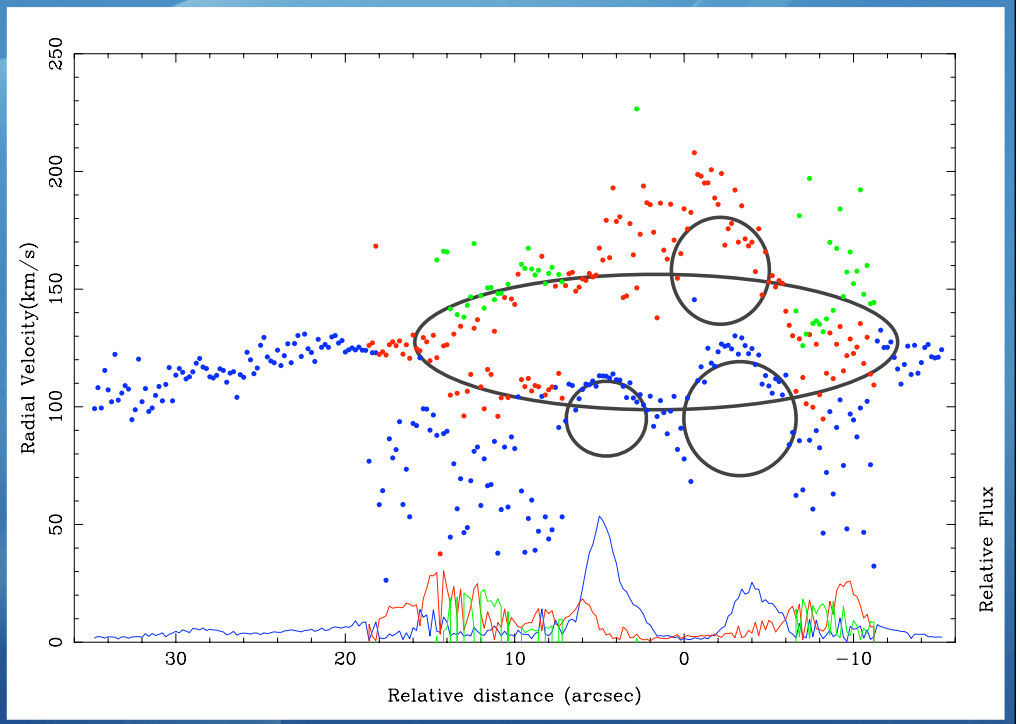
- The Hα emission lines have been fitted with two gaussian components, but in some cases we had to use three components for a better fit.
- For each line, we have obtained flux, line-width (km/s) and velocity (km/s).

Red-0°


Velocity Field in the Bubble
Relative Distance (arcsec)
40
20
0
−20
−400
−200
0
200
400
Expansion Velocity (km/s)

Red-0°





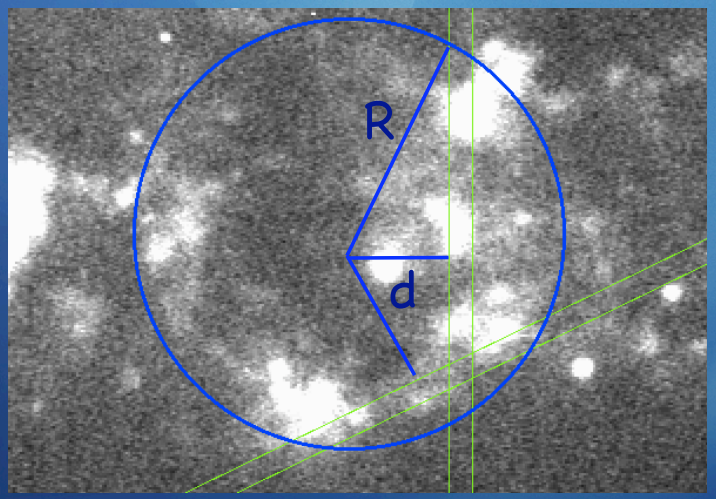
$v_r = v_{max} \cos\alpha \cos\beta.$

v_r = 35 km/s

Red-0°

$\alpha = \arcsin(d/R)$

β angle along the slit



$v_r = v_{max} \cos\alpha \cos\beta.$

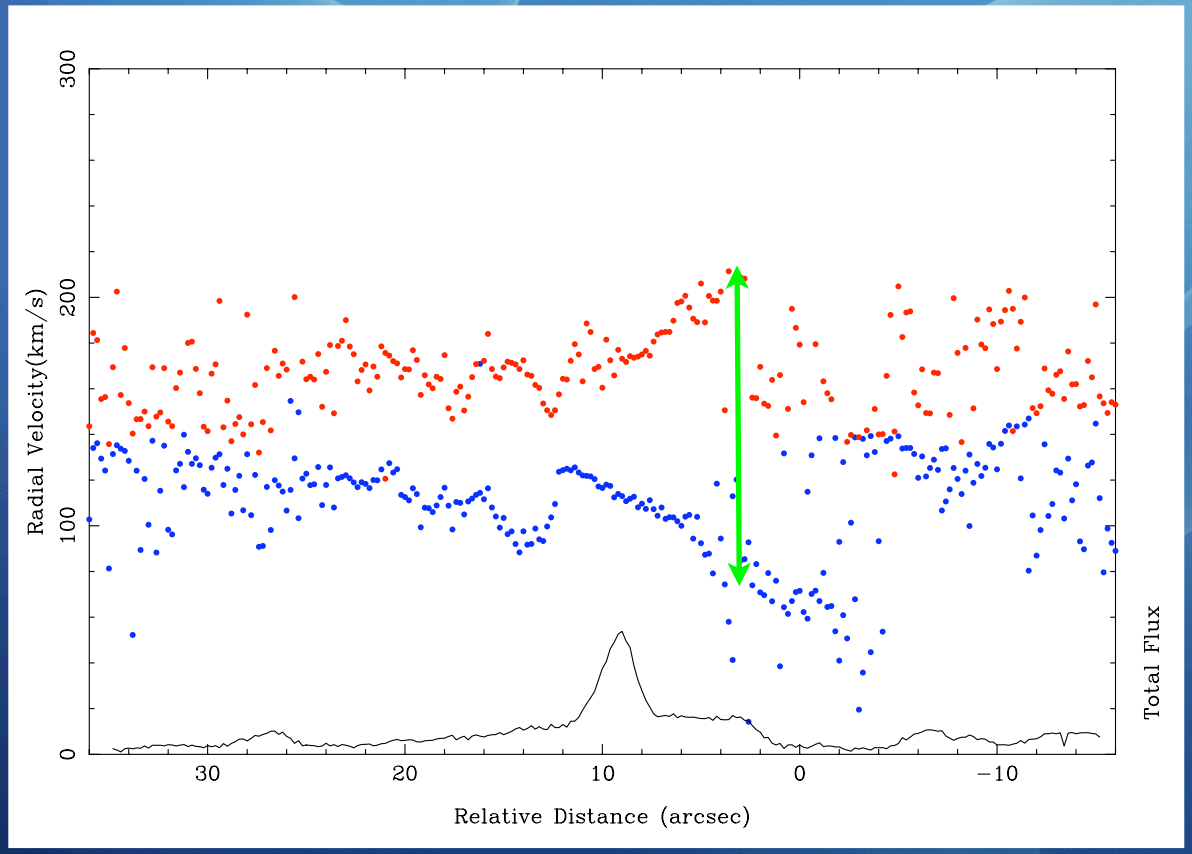
	Main bubble	Sub-bubble
	$v_{max} \geq 35$ km/s R~340 pc	$v_{max} \geq 20$ km/s r~50 pc
t=R/v		
	t ≤ 10 Myrs	t ≤ 2.5 Myrs

An estimated value for the velocity
R~340 pc

d~240 pc v_{max} ~ 50 km/s

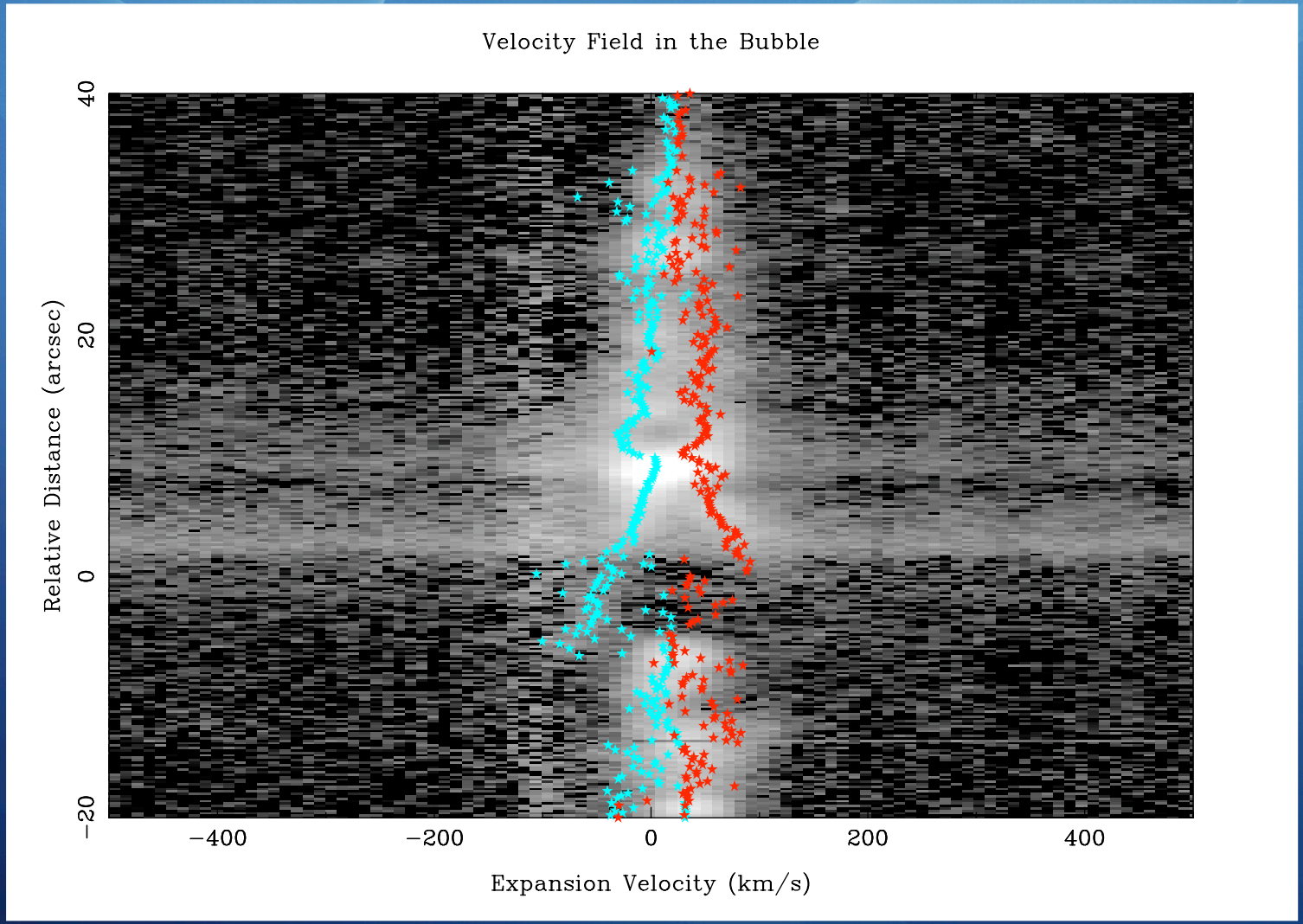
These kinematic ages are compatible with stellar population ages

Red-296°



- Two gaussian components have been fitted.
- Structure of an expanding bubble.
- Large perturbations overimposed on the main bubble.

Red-296°


Velocity Field in the Bubble
Relative Distance (arcsec)
40
20
0
−20
−400
−200
0
200
400
Expansion Velocity (km/s)

Conclusions

- Kinematics of ionized gas shows a complex structure, with some bubbles formed in the wall of the main bubble, and others in inner regions.
- We are not observing shock signatures in the studied regions.

Future Work

- Connect Hα kinematics with other gas tracers
- More detailed analysis of the diagnostic diagrams