

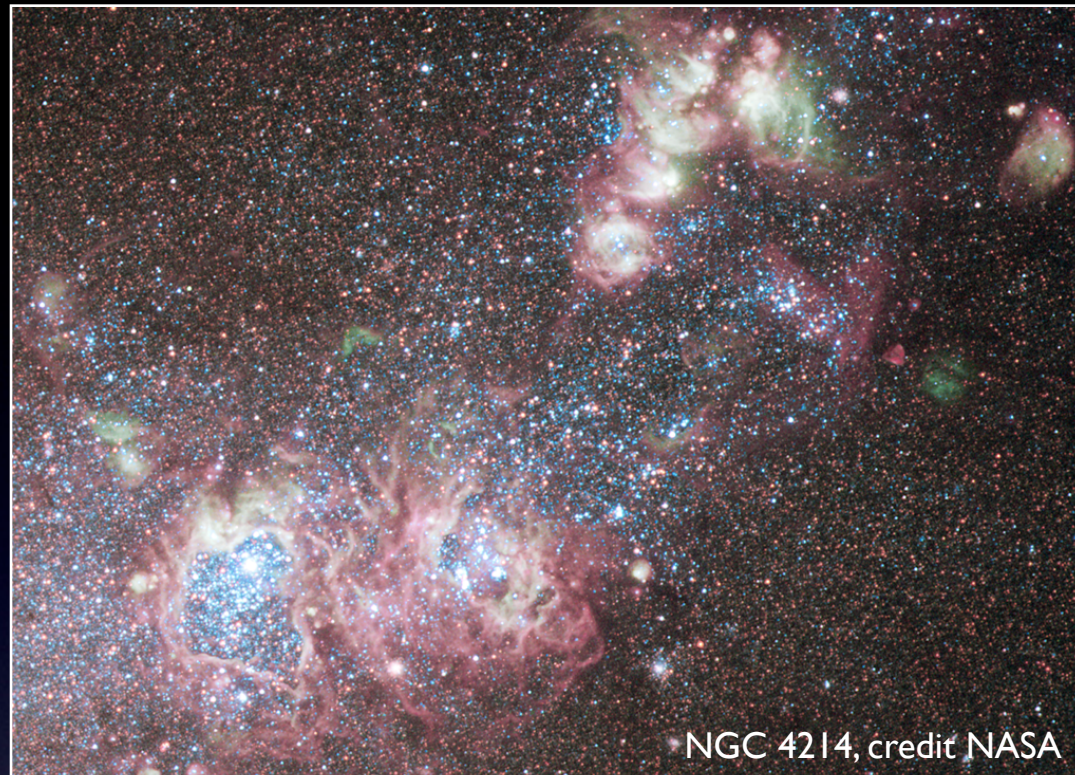
A kinematic analysis of the Giant HII region of N I I

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Giant HII regions (GHIIR)



Regions dominated by massive stars

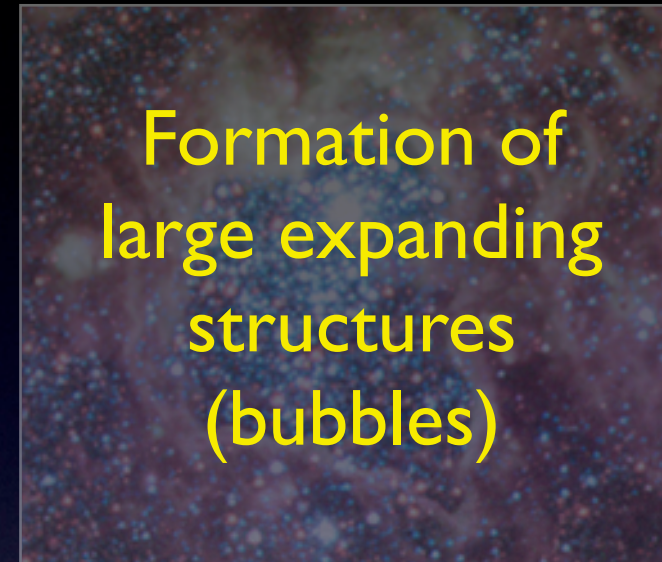


What is the effect of these stars in the ISM?

Injection of UV radiation
and mechanical energy
through stellar winds and/
or SN explosions.



Formation of
large expanding
structures
(bubbles)



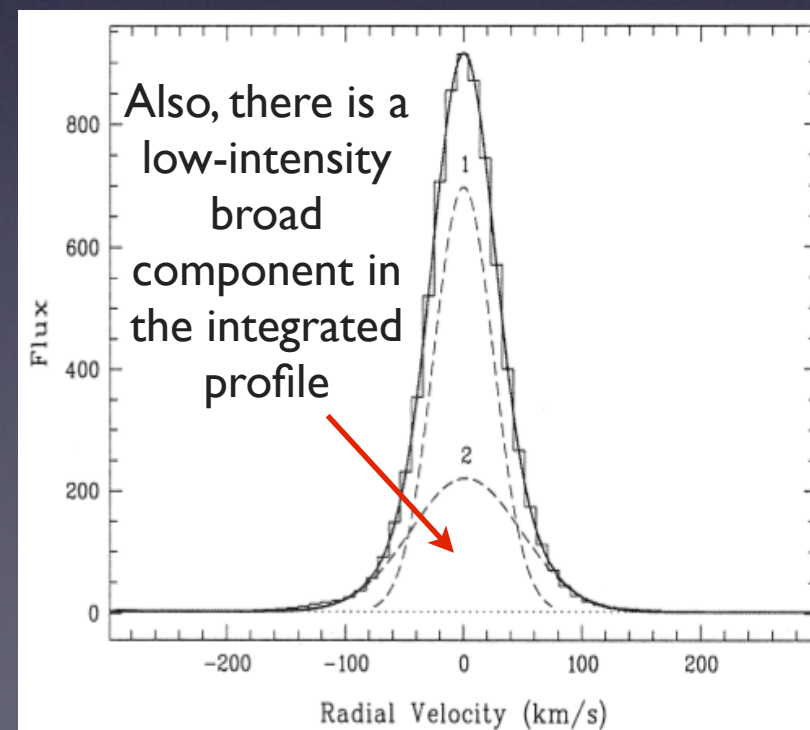
One of the most well studied giant
HII regions correspond to 30
Doradus, in the Large Magellanic
Cloud.

Spectroscopic studies have found
supersonic widths in the integrated
H α profile of GHIIR (e.g. 30 Dor,
Melnick et al. 1999)

*The origin of the supersonic
motions in GHIIR is still
“unknown”...*

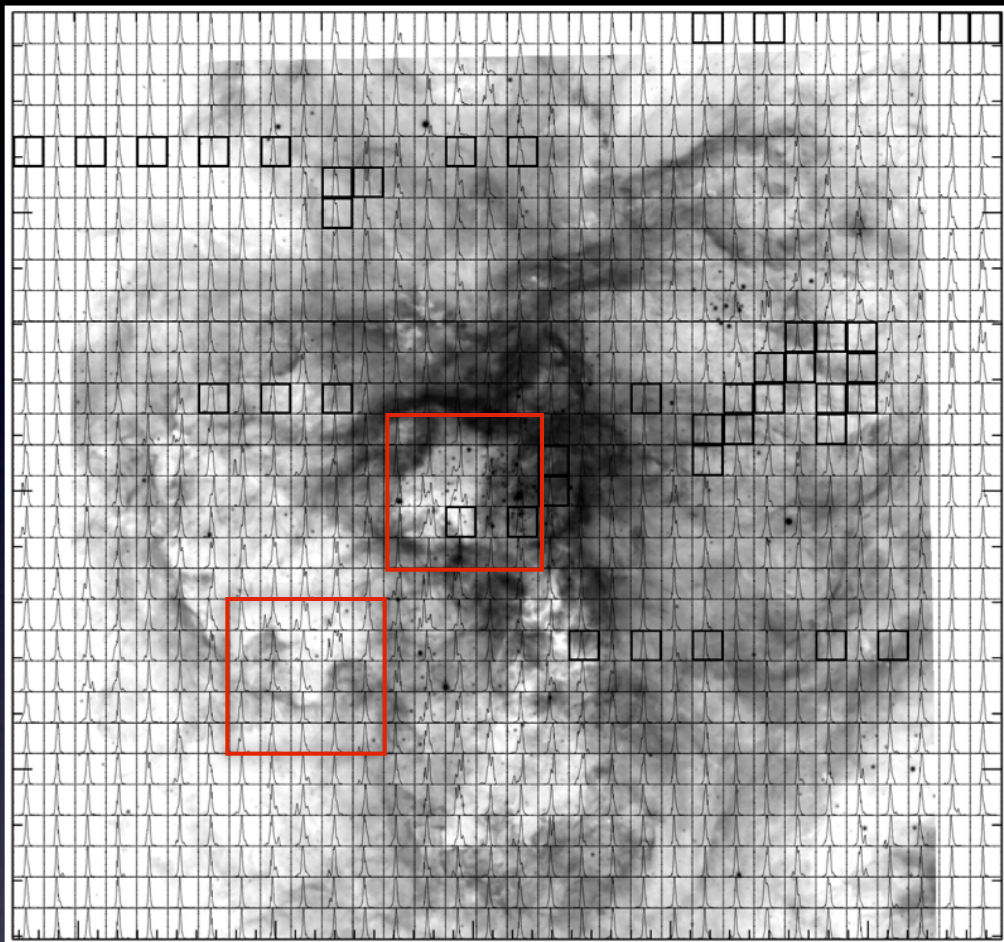
*The origin of the low-intensity
broad component is still
“unknown”...*

*These facts motivated us to study
the kinematic of GHIIR using high
resolution spectroscopic data cubes*

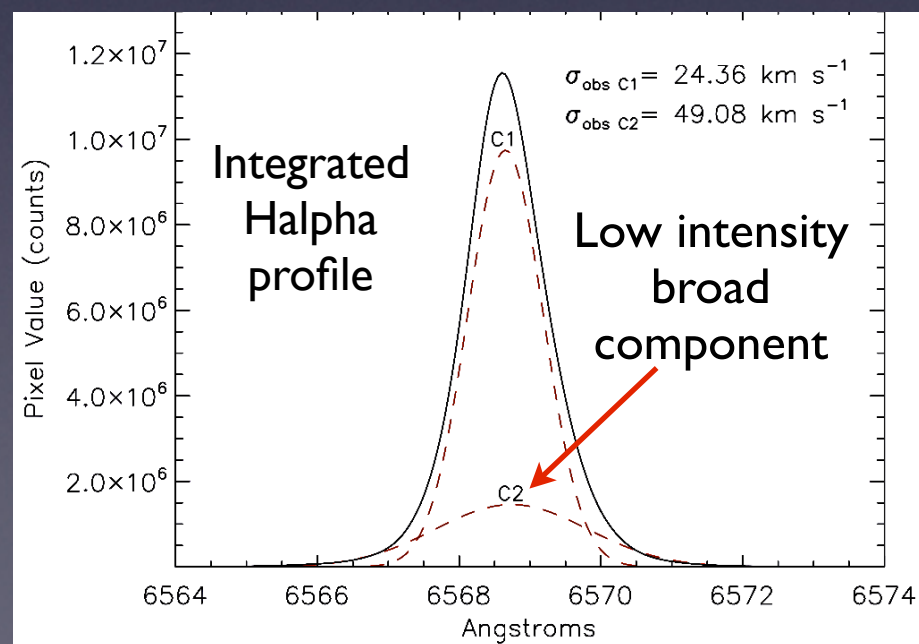


The first target: 30 Doradus

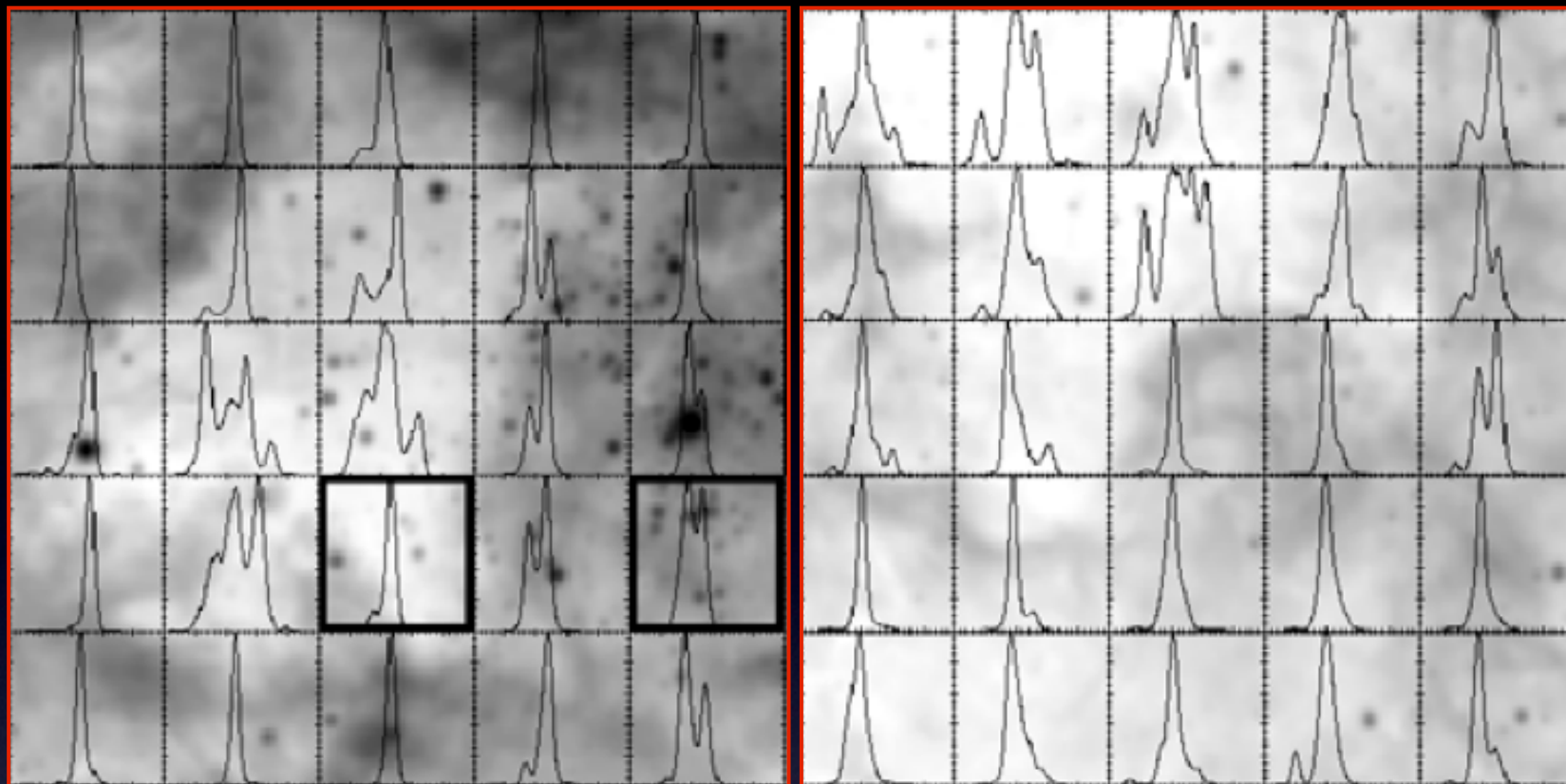
Using VLT/GIRAFFE MEDUSA observations we derived a **data cube** of 10'x10'



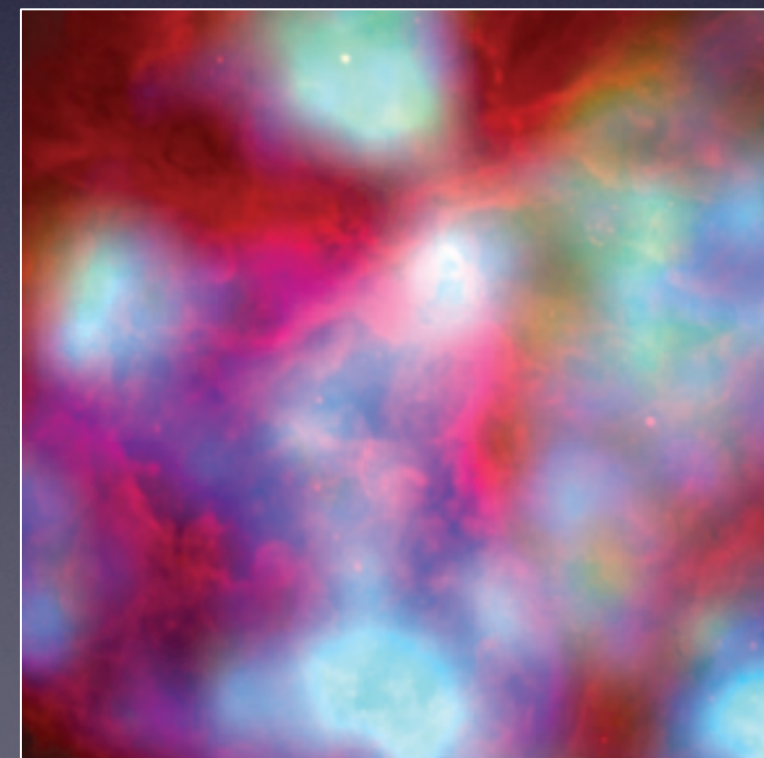
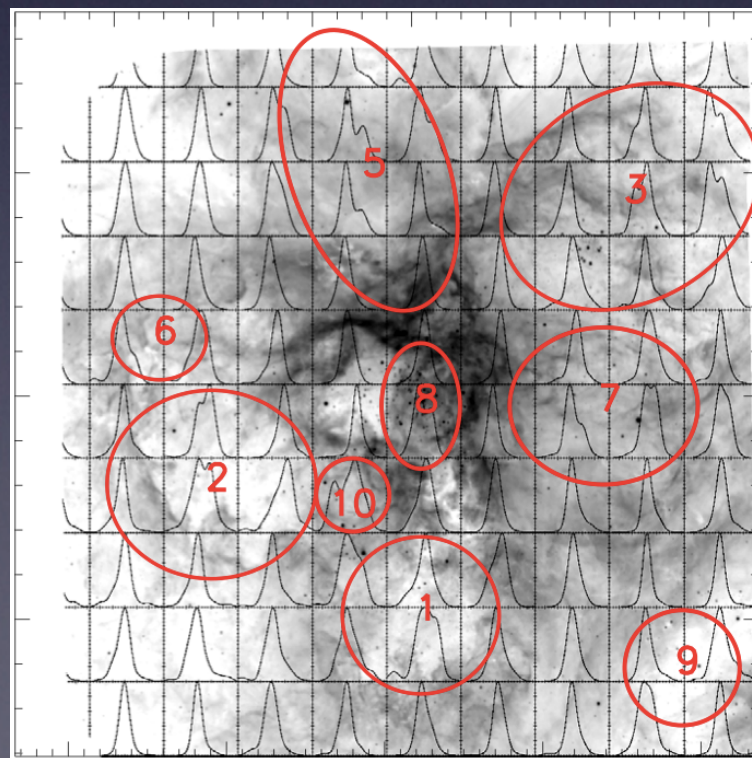
Torres-Flores et al. 2013b



Extremely complex H α profiles across the whole region



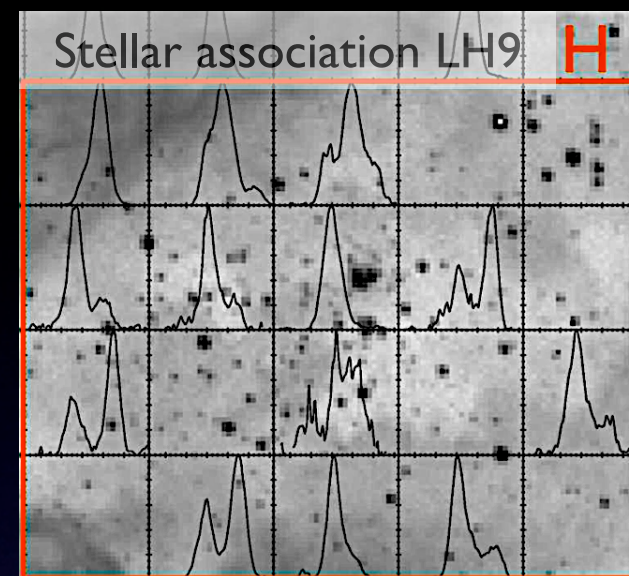
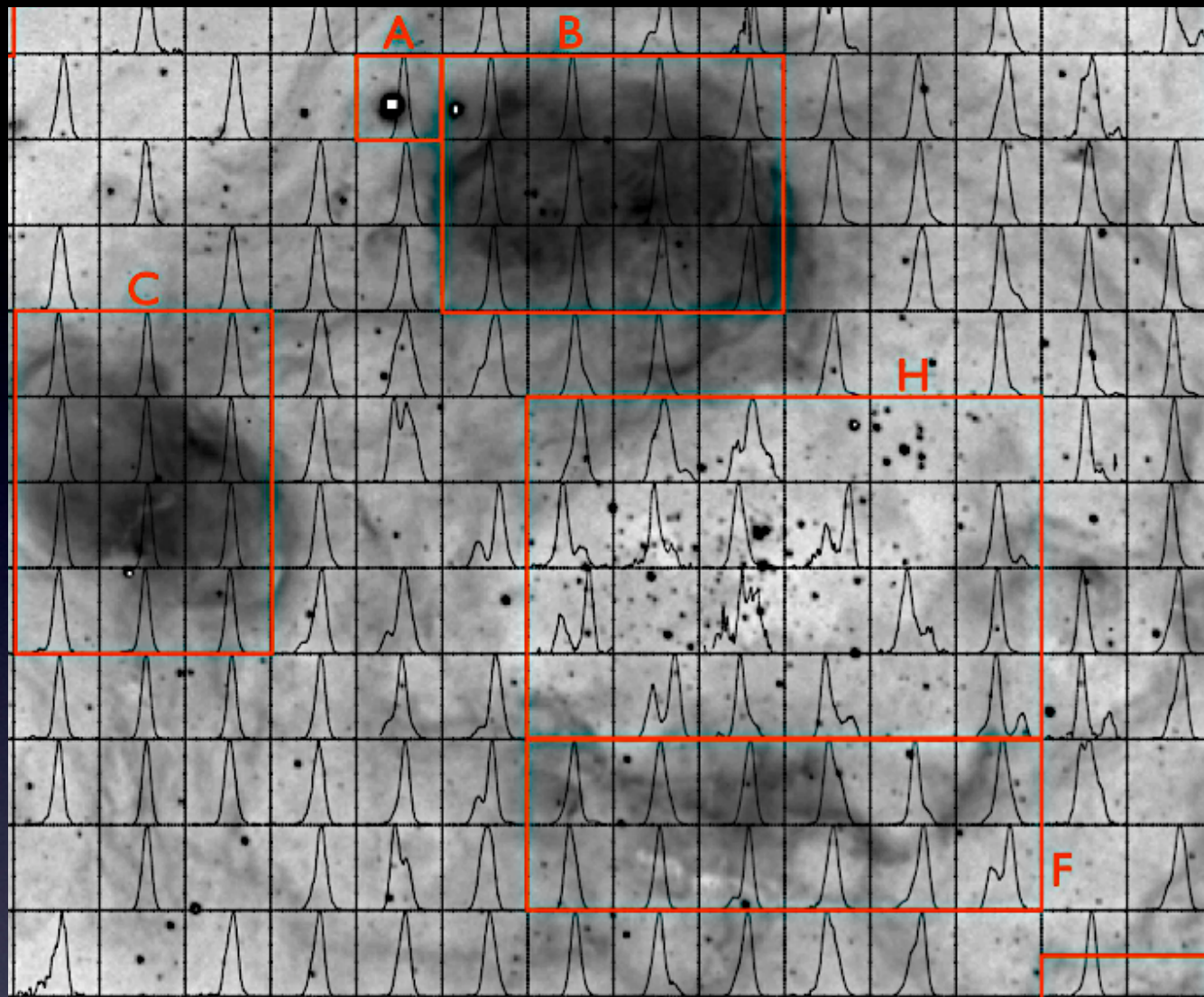
Expanding bubbles correlate with soft x-ray emission



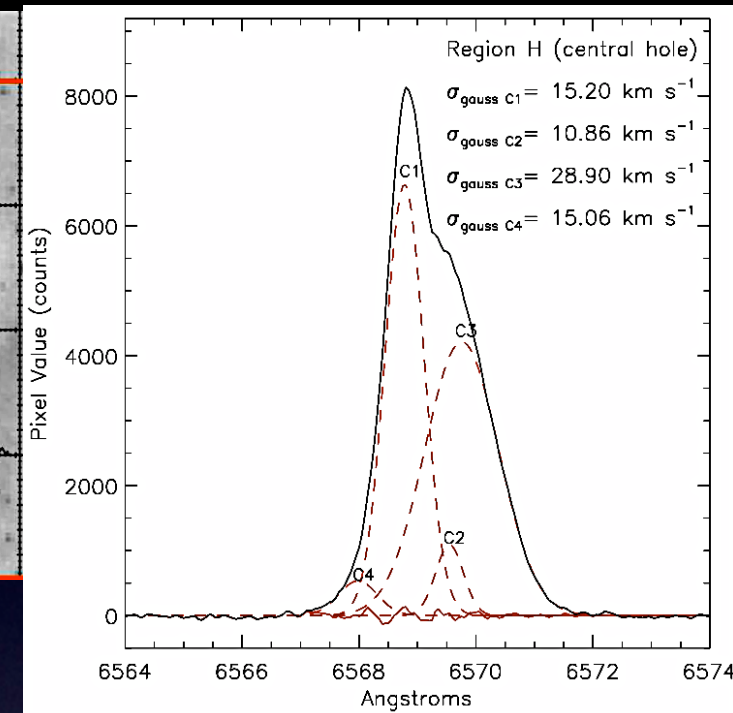
Tonwsley et al. (2006)

The case of N I I: Data cube derived from GIRAFFE/MEDUSA observations

N I I displays mostly simple H α profiles, when compared with 30 dor



Expanding velocity of 23 km s^{-1}

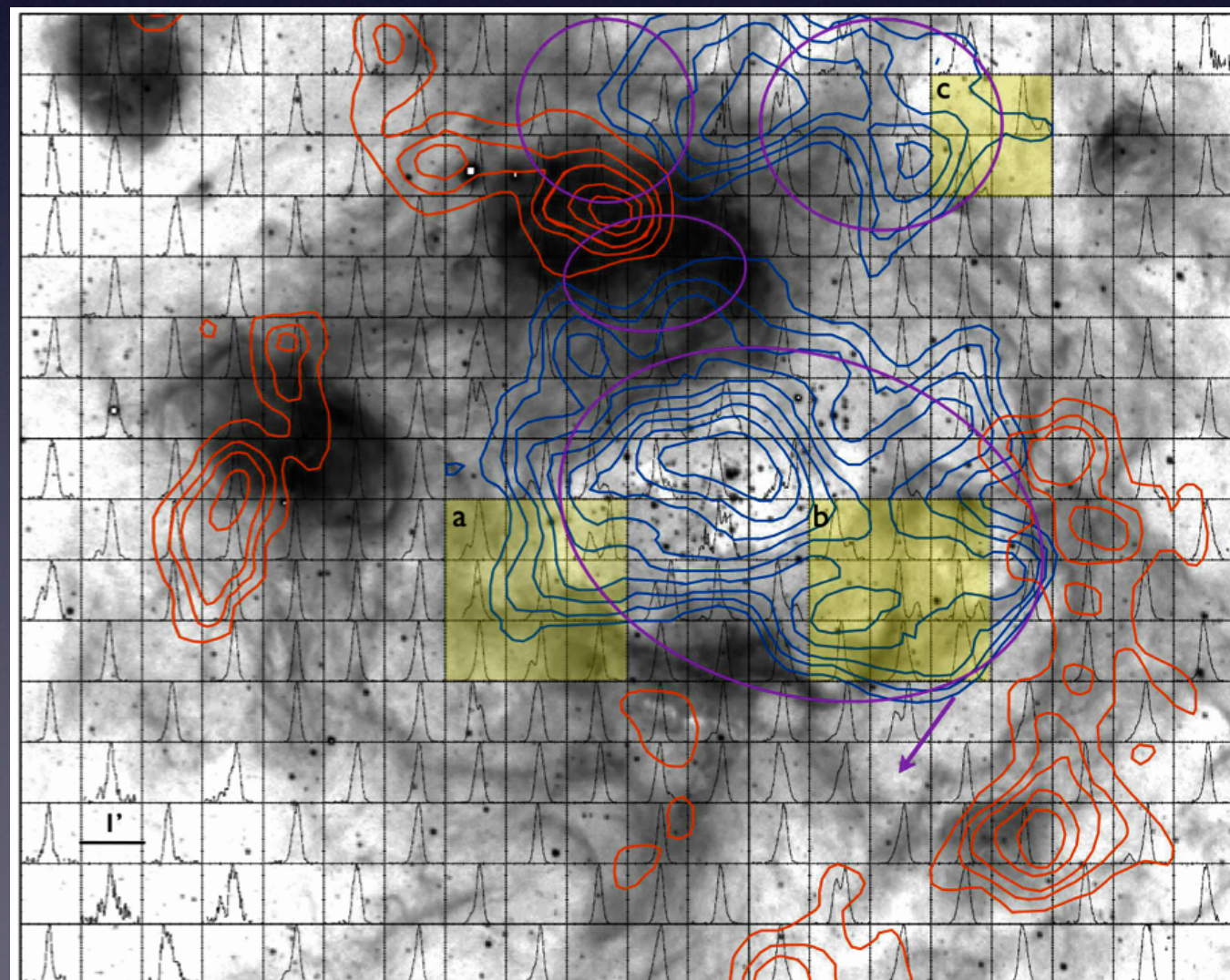
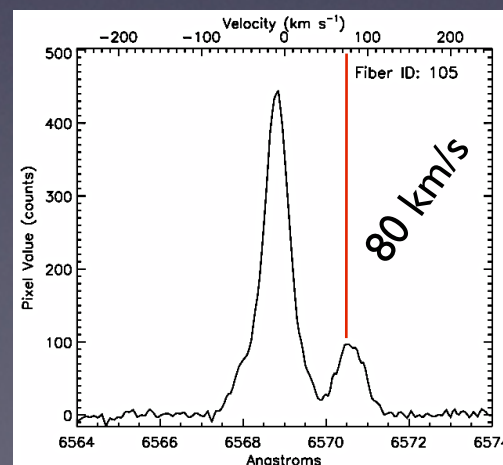


X-ray (Nazé et al. 2004, Maddox et al. 2009): This emission is mostly confined in the central region (blue and violet colors)

CO(2-1) (Herrera et al. 2013) confine the X-ray emission

Some regions display H α high velocity components (yellow boxes), which correlate with x-ray emission

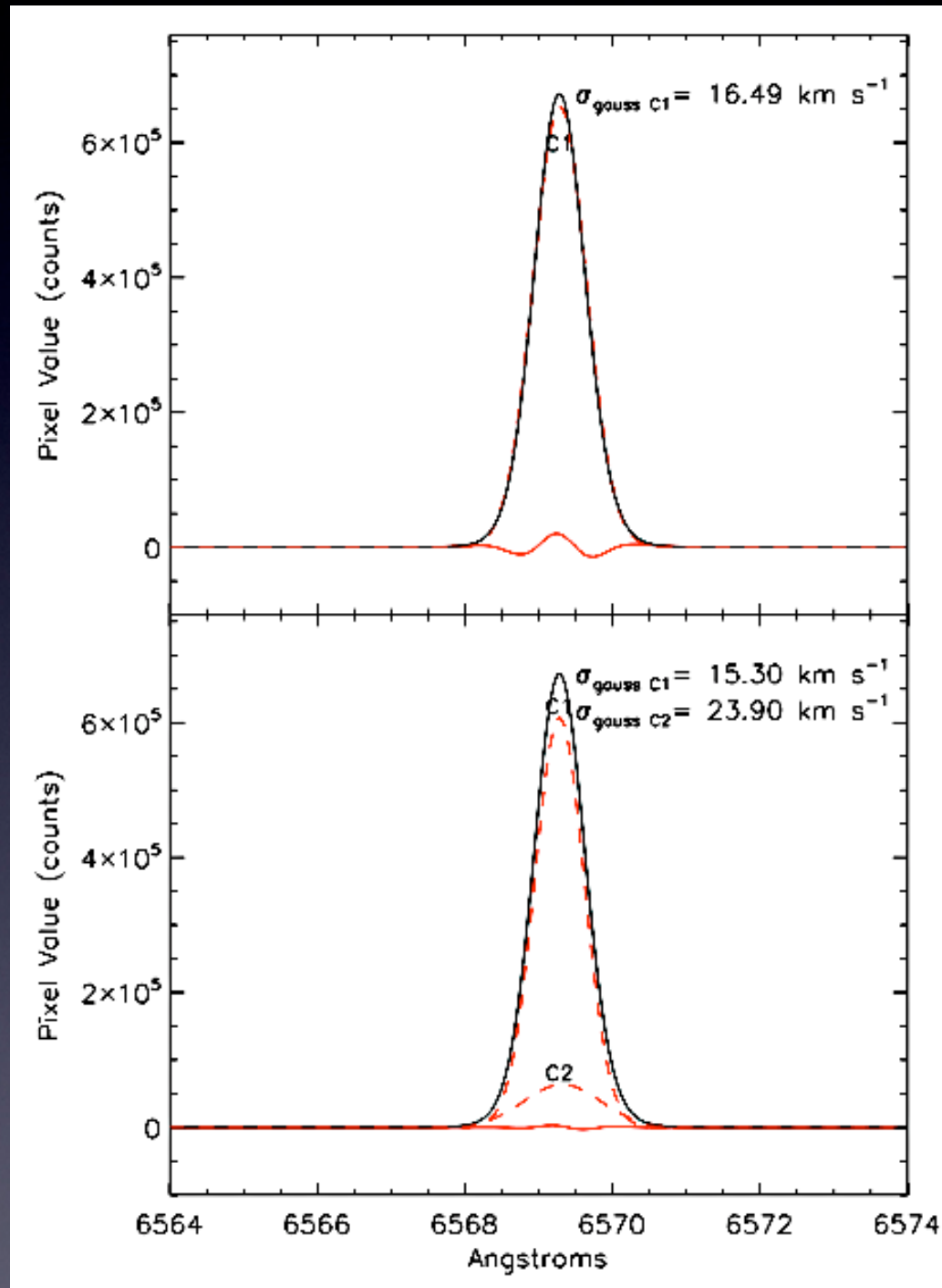
Hot gas leaking?



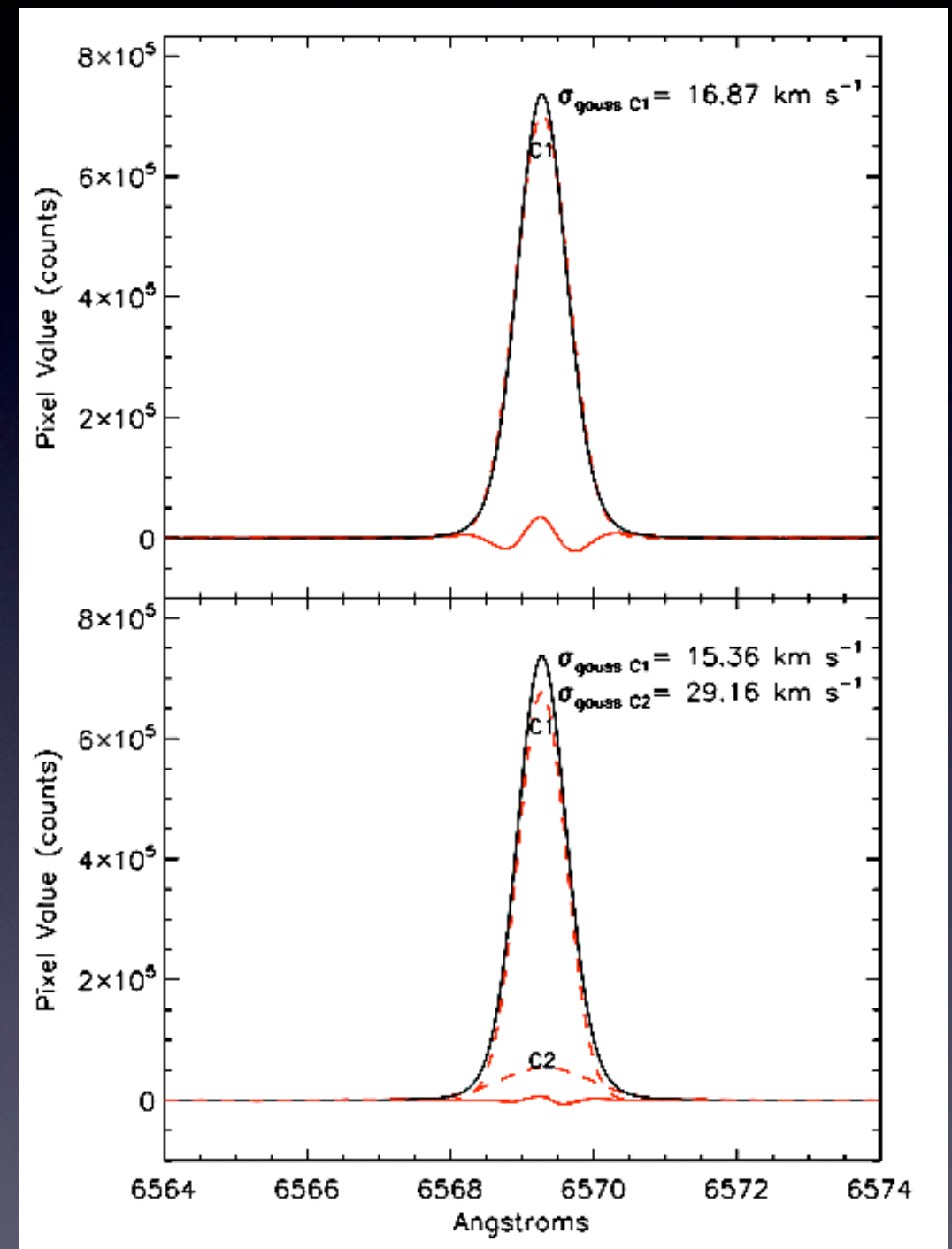
Some comparisons...

By fitting single Gaussians on each observed profile, we derived a modeled data cube.

Integrated H α profile on this modeled data cube



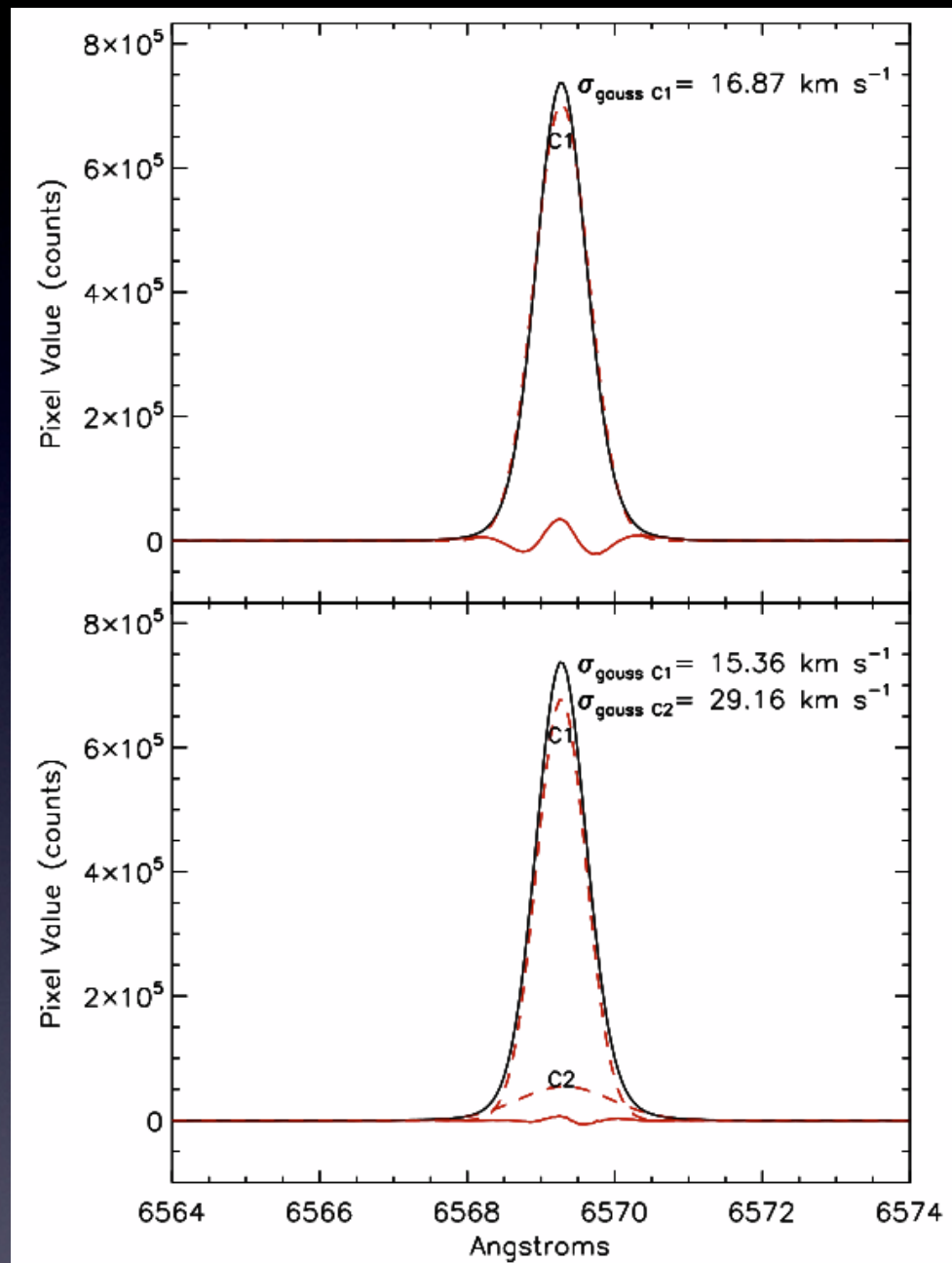
Integrated H α profile derived from observations



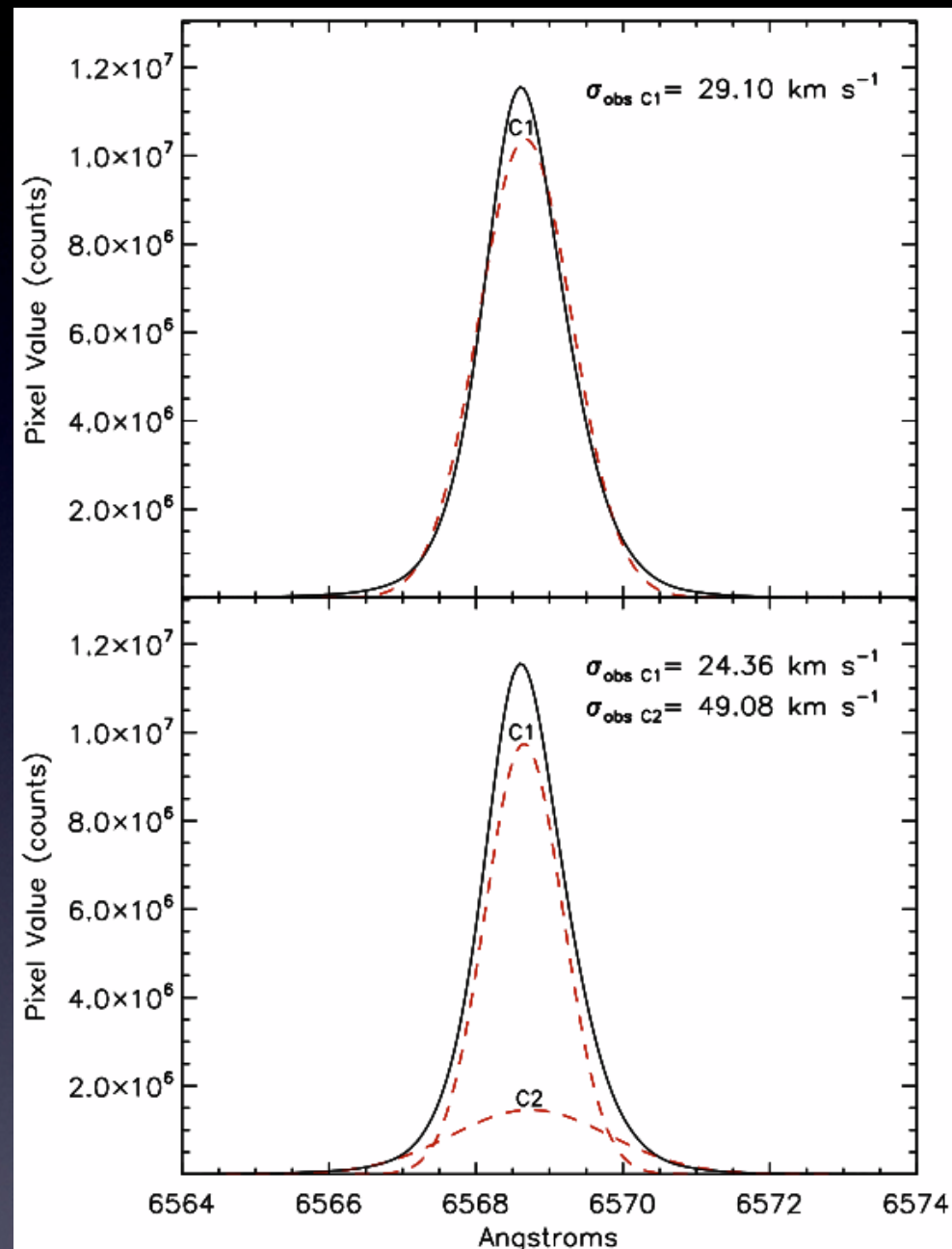
In both cases we fit a secondary low-intensity component. In the model, this component arises from the contribution of different single Gaussians at different radial velocities

Comparing NII with 30 Dor... Different evolutionary stages: 30 Dor is younger than NII

Integrated Halpha profile for NII



Integrated Halpha profile for 30 Dor



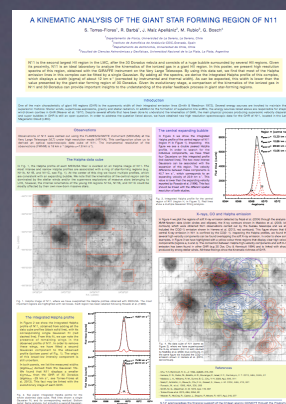
The Halpha integrated profiles display different widths

The contribution of the low intensity broad component in NII seems to be less important in the integrated Halpha profile

Origin?... several expanding structures?

These results show the importance of 3D data to analyze the kinematics of GHIIR!

More information in a poster!!!



An advertisement: "A 3D analysis of the metal distribution in the merging compact group of galaxies HCG 31" (Poster T91)

