

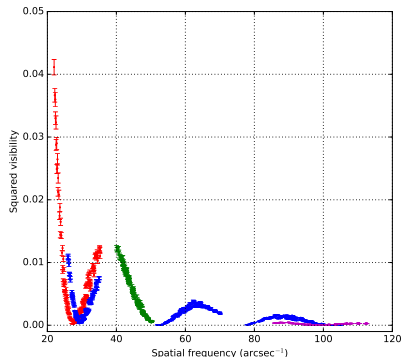
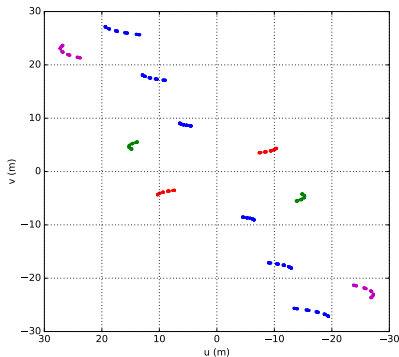
Convection on red supergiants: NIR interferometry

Miguel Montargès (IRAM)

Betelgeuse Workshop 2016 - Meudon

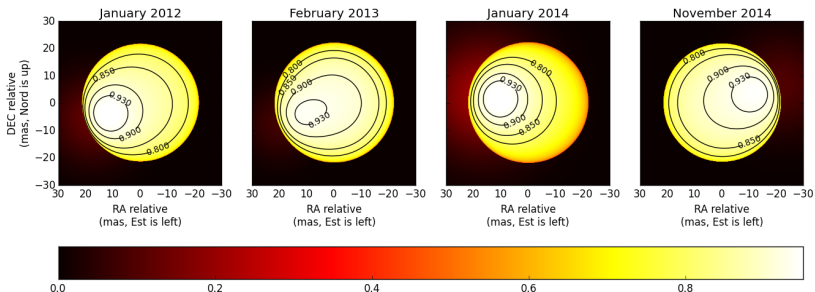
September 5th-8th 2016

VLTI/PIONIER observations of Betelgeuse



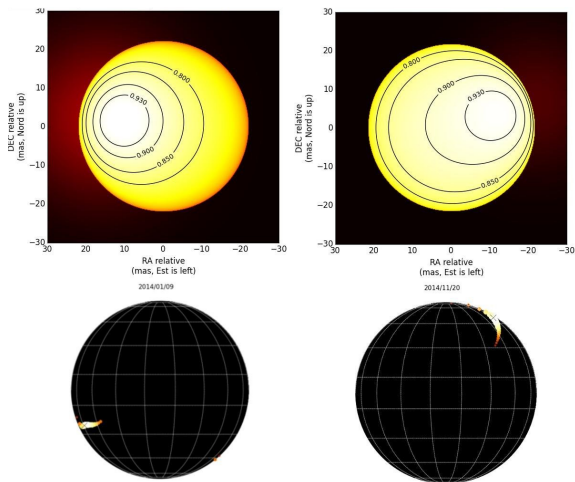
- VLTI/PIONIER observations (4 telescopes, H band, low spectral resolution)
- 4 epochs of monitoring: Jan. 2012, Feb. 2013, Jan. 2014 and Nov. 2014
- Only the compact array configuration (baseline length $\in [11; 36 \text{ m}]$)

Intensity maps



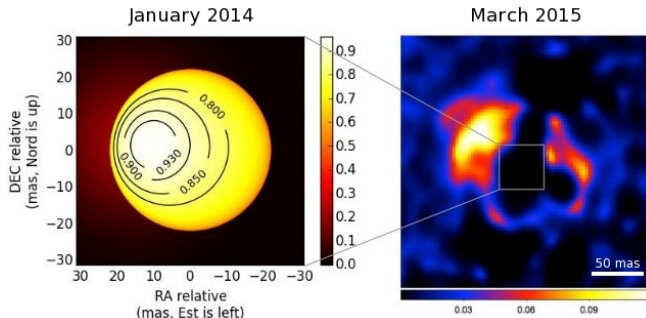
- Consistent on the 4 epochs
 - Reproduces also the closure phases
 - 3D RHD convective simulations DO NOT reproduce the observations
- Montargès et al. 2016, *A&A*, 588, A130.

Comparison with TBL/NARVAL observations



Aurière et al., 2016, *A&A*, 591, A119

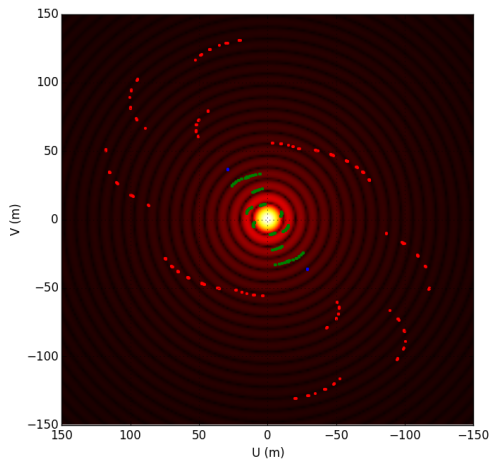
Comparison with VLT/SPHERE imaging



Montargès et al. 2016, *A&A*, 588, A130 (PIONIER)

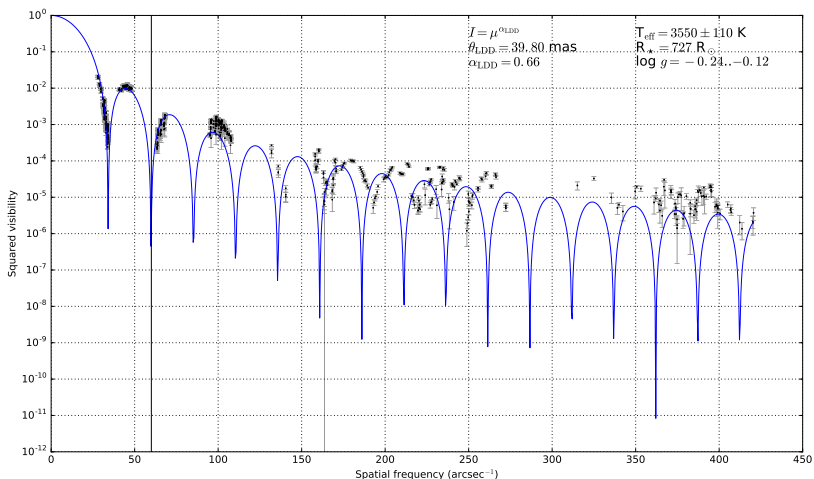
Kervella et al. 2016, *A&A*, 585, A28 (SPHERE)

Isolating the convection signal ? The example of α Sco



(Montargès et al. in prep.)

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Isolating the convection signal ? The example of α Sco

- Power Spectral Density approach (subtraction of the disk contribution) : continuous distribution of convective cells from $1 R_{\star}$ to $1/15$ th R_{\star}
- 3D RHD simulations reproduce the simulation BUT probable bias toward the simulation with the highest numerical resolution

(Montargès et al. in prep.)