Practice session guide: rotation 1/2

- We will use the JMMC LITpro tool
- Load OIFITS data file into LITpro containing the VLTI/VINCI H- and K-band squared visibilities: ../Rotation-Spots/Achernar_all_VINCI_without_U1-U4.fits
- Check uv-plane and available data (squared visibilities)
- Fit a uniform disk (UD) model as a first try
- Set parameter bounds and initial values (remember that LITpro will converge to the local minimum) and perform the fit
- Evaluate fit quality (χ^2, correlations between parameters, plots of V and residuals)
- Create an image of your model
- Can we extract more information from the data than just a UD angular diameter ?

Practice session guide: rotation 2/2

- Repeat the previous procedure using a uniform ellipse model. Is the quality of the fit significantly improved?

- Measure orientation, minimum rotation flattening and estimate the minimum rotation velocity rate using :
$V_{eq}/V_{crit} > (3*(1-1/flatten\_ratio))^{0.5}$

- From the UD angular diameter and average uniform ellipse angular diameter estimate the mean effective temperature of Achernar (B3Ve-B6Ve type star) using the bolometric flux F_{bol}:

$F_{bol}=(diameter/2)^2*\sigma*T_{eff}^4$
$F_{bol} = 50*10^{-6}$ erg/cm^2/s

- Can we improve even more the fit ? In orher words, are there more physical information in the data ? Play with the possible models… Estimate the relative fluxes between the rotationally flattened photosphere and any additional component introduced in the model.

- Generate images of the models

Practice session guide: spots

- Load OIFITS data file into LITpro containing the VLTI/AMBER H- and K-band squared visibilities and closure phases: ../Rotation-Spots/2007*.fits

- Check uv-plane and available data (squared visibilities and absolute closure phases)

- Fit a uniform disk (UD) model and evaluate fit quality (χ^2, correlations between parameters, plots of V and residuals)

- What the closure phases suggest us, specially in the vicinity of the visibility minima ?

- Add one (or more) components (UD models for example) to take into account possible spots and perform a new fit.

- Generate images of the models

- From the UD angular diameters estimate the effective temperature of Canopus (F0Ib -F0II type star) using the bolometric flux F_{bol}:

$F_{bol}=(diameter/2)^2*\sigma*T_{eff}^4$
$F_{bol} = 45*10^{-6}$ erg/cm^2/s