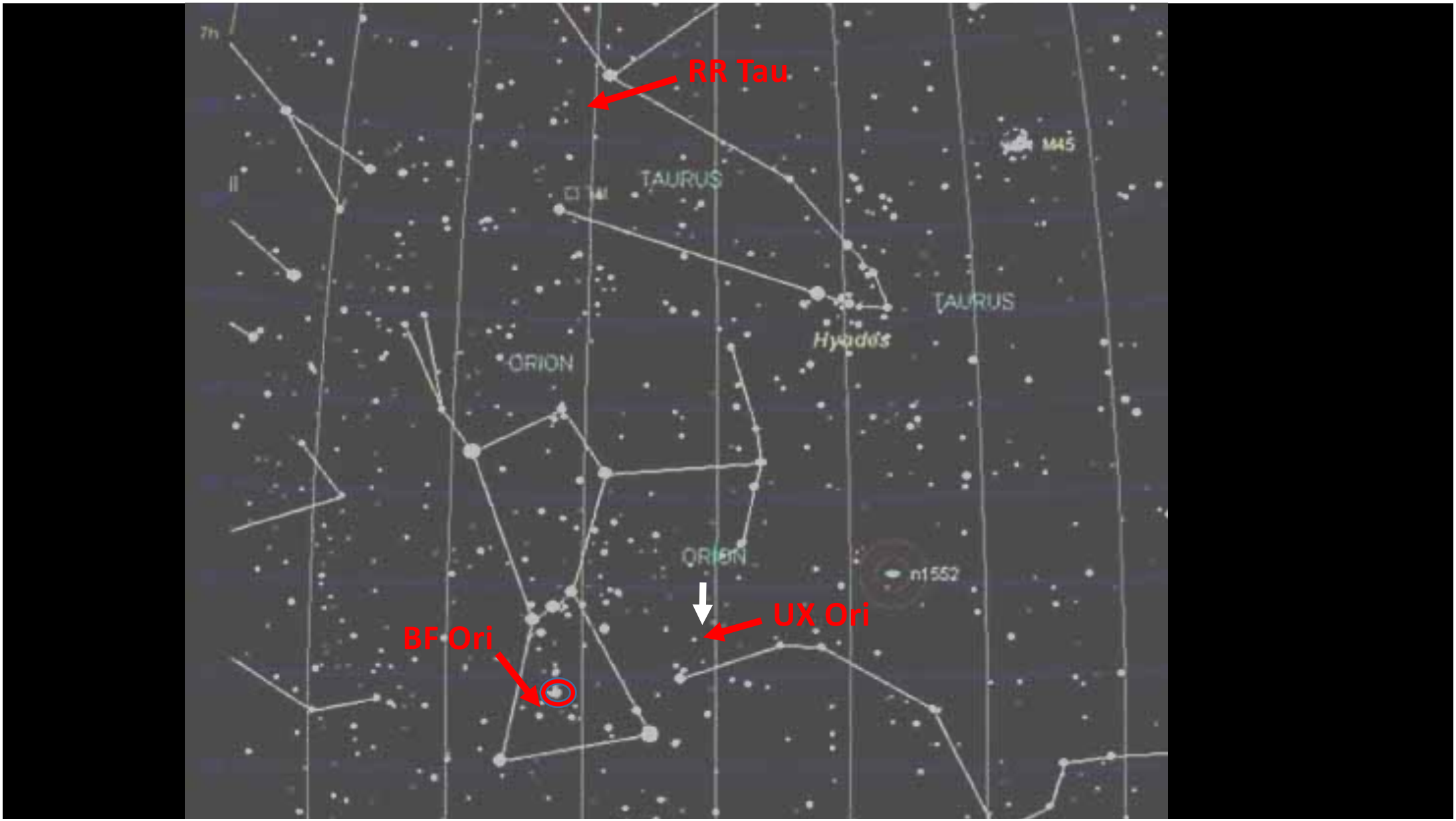
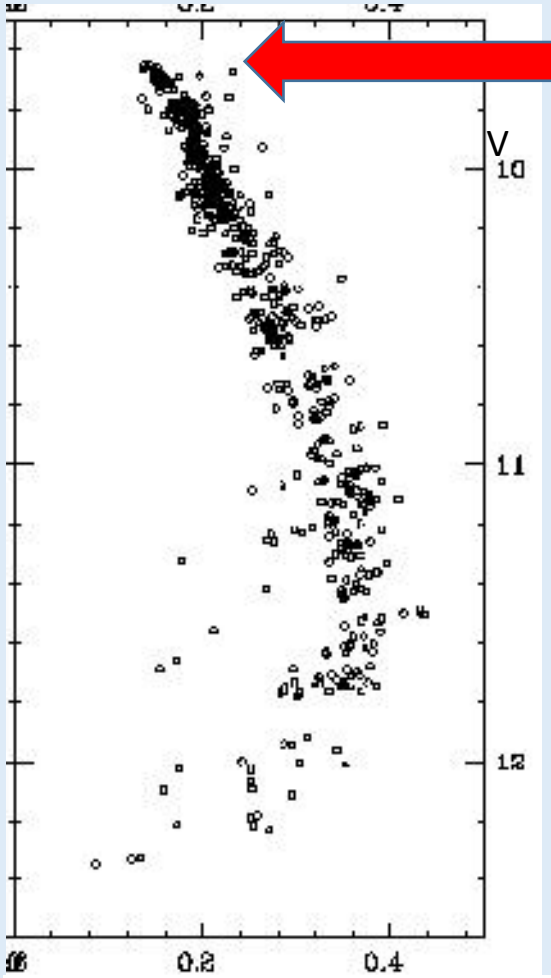
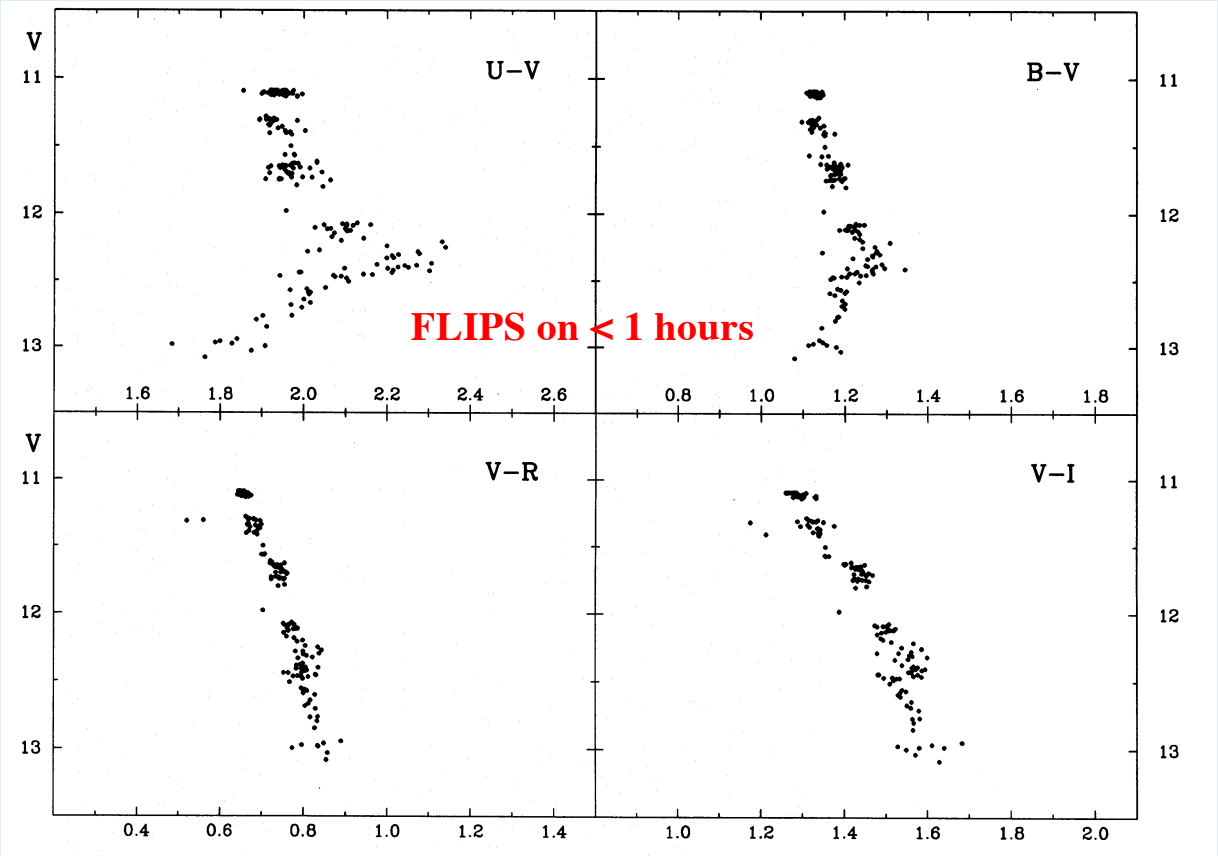

RR Tau
TAURUS
M45
TAURUS
Hyades
ORION
ORION
n1552
UX Ori
BF Ori



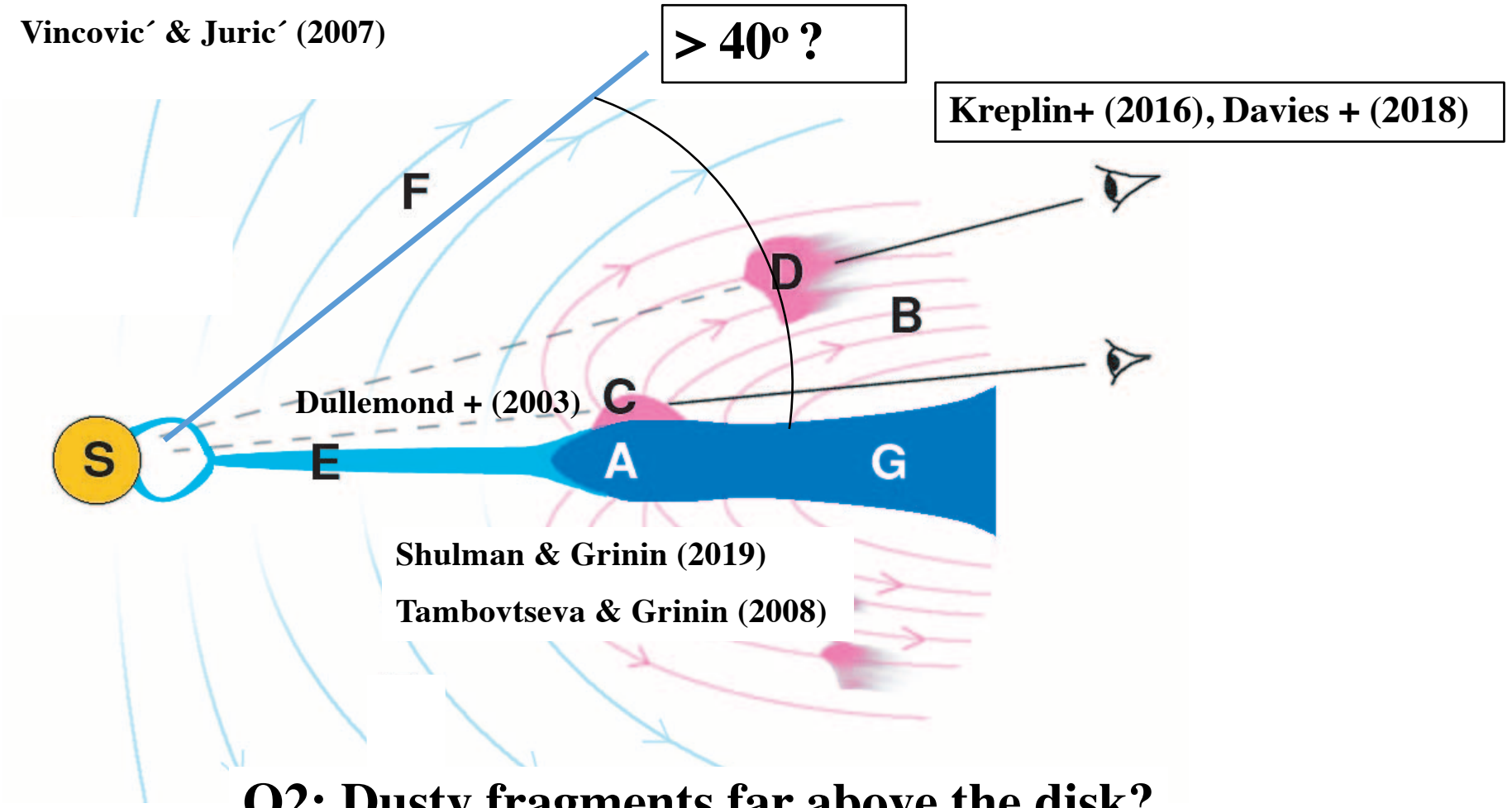
Covered by large dust grains in the foreground disk?

Gahm + (1988, 1993): RY Lup, type TTS



S Cr A (Gahm, Petrov, Tambovtseva, Grinin Stempels, Walter 2018) **possible flips < 1 day**

Q1: Any colour flips in UXORs?

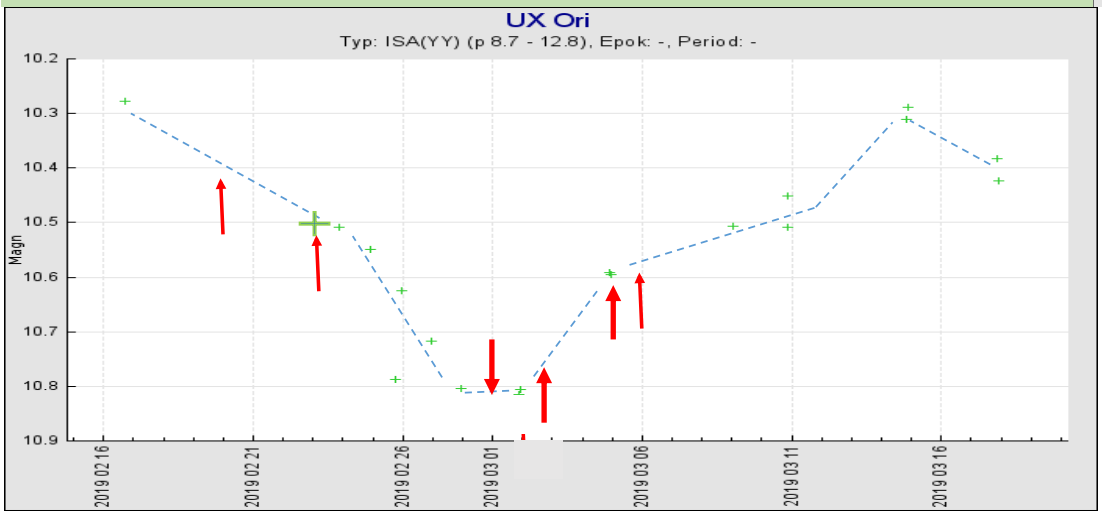


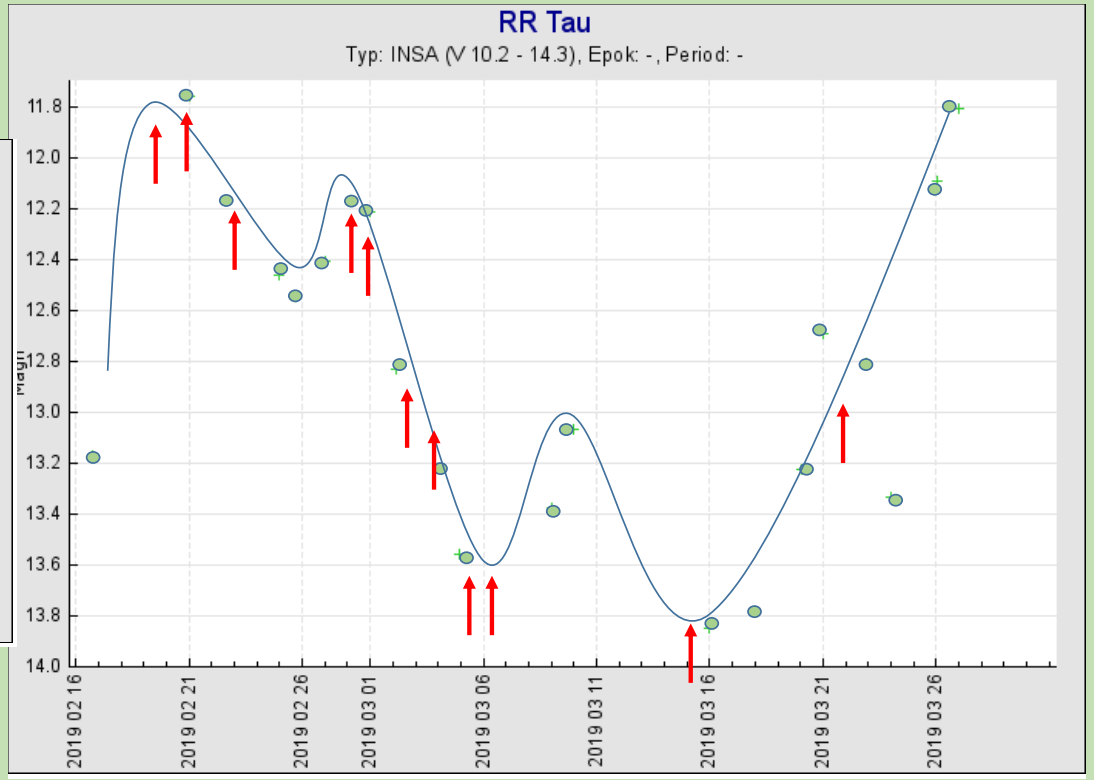
Q2: Dusty fragments far above the disk?

2019: Gahm, Djupvik (NOT) + Luleå Technical University
also: Grinin and Krelowski

NOT: spectra R = 25 000, 3600 – 9400Å.

Photometry: Swedish Amateur Astronomy Org.

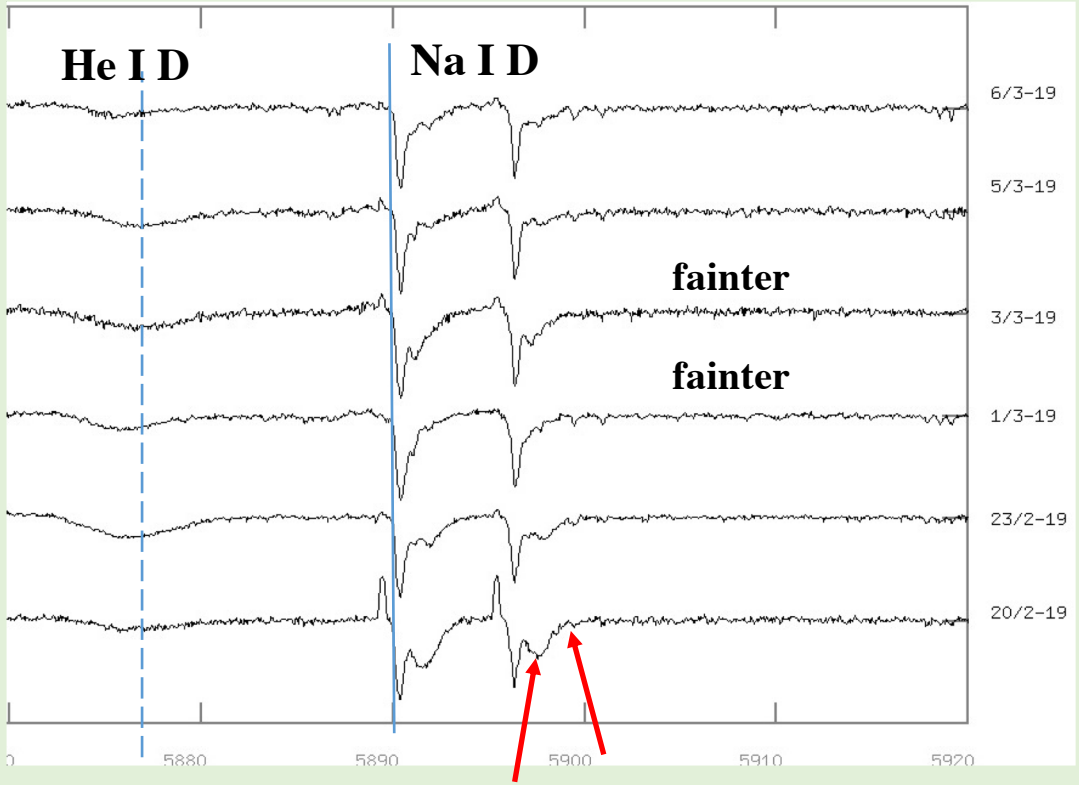




Grinin + (2001)
Rodgers + (2002)

To be continued

UX Ori 2019

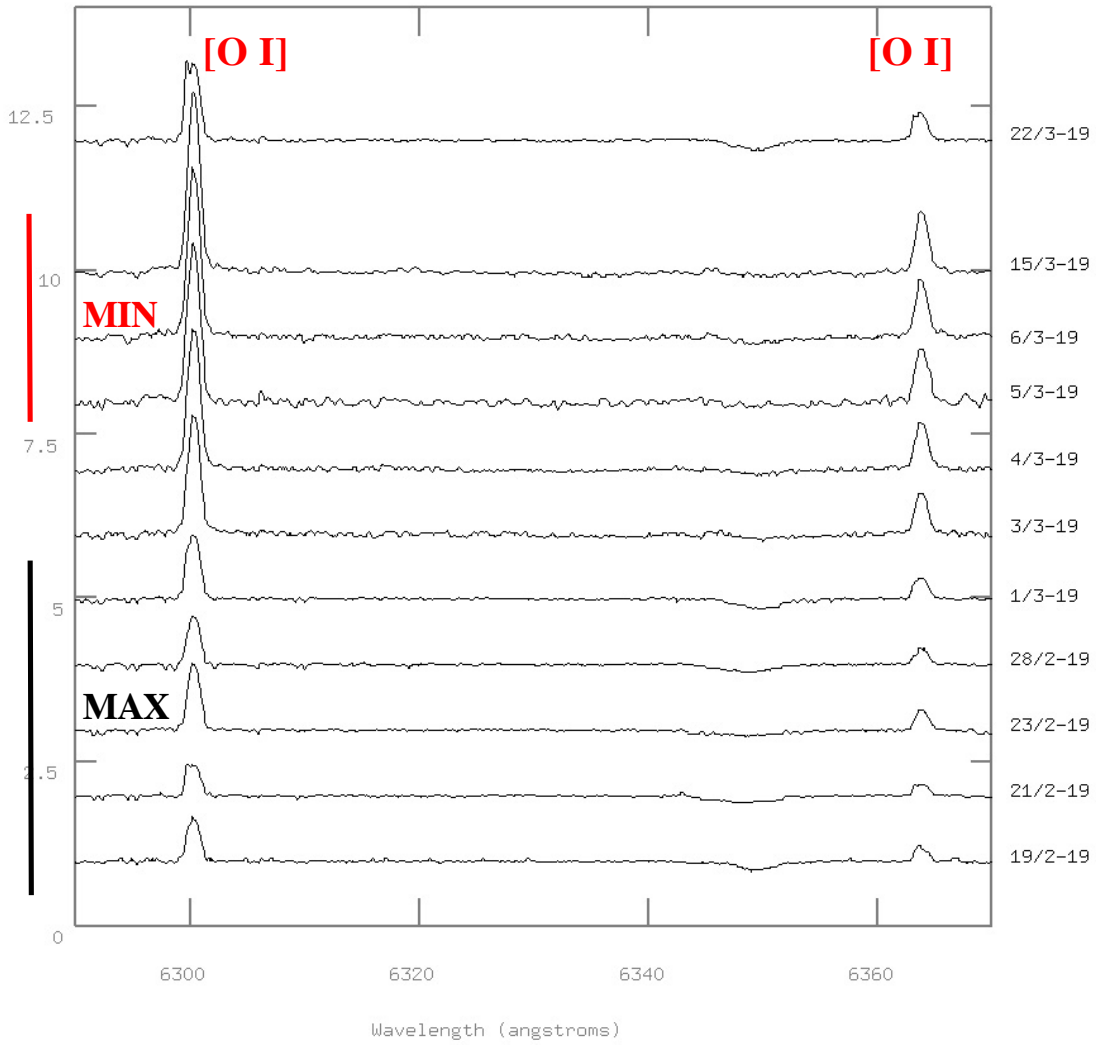


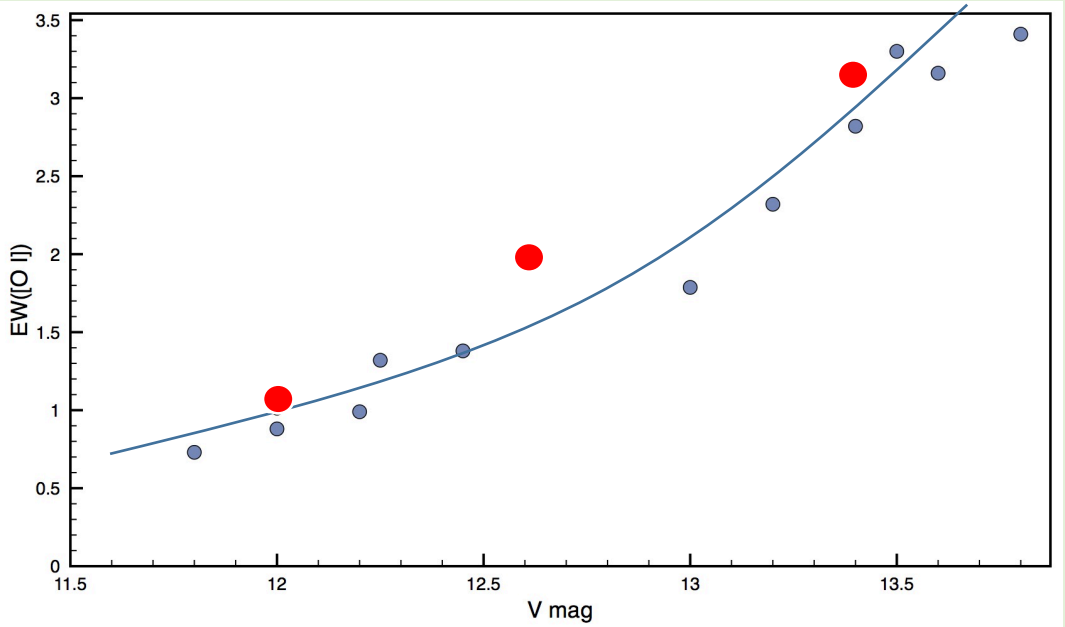
+60 km/s (to +140) **Natta+ (2000), Potravnov+ (2019)**

During accretion event: no related occultation

Q3: Any ecidence of spectrocopic binaries?

RR Tau 2019

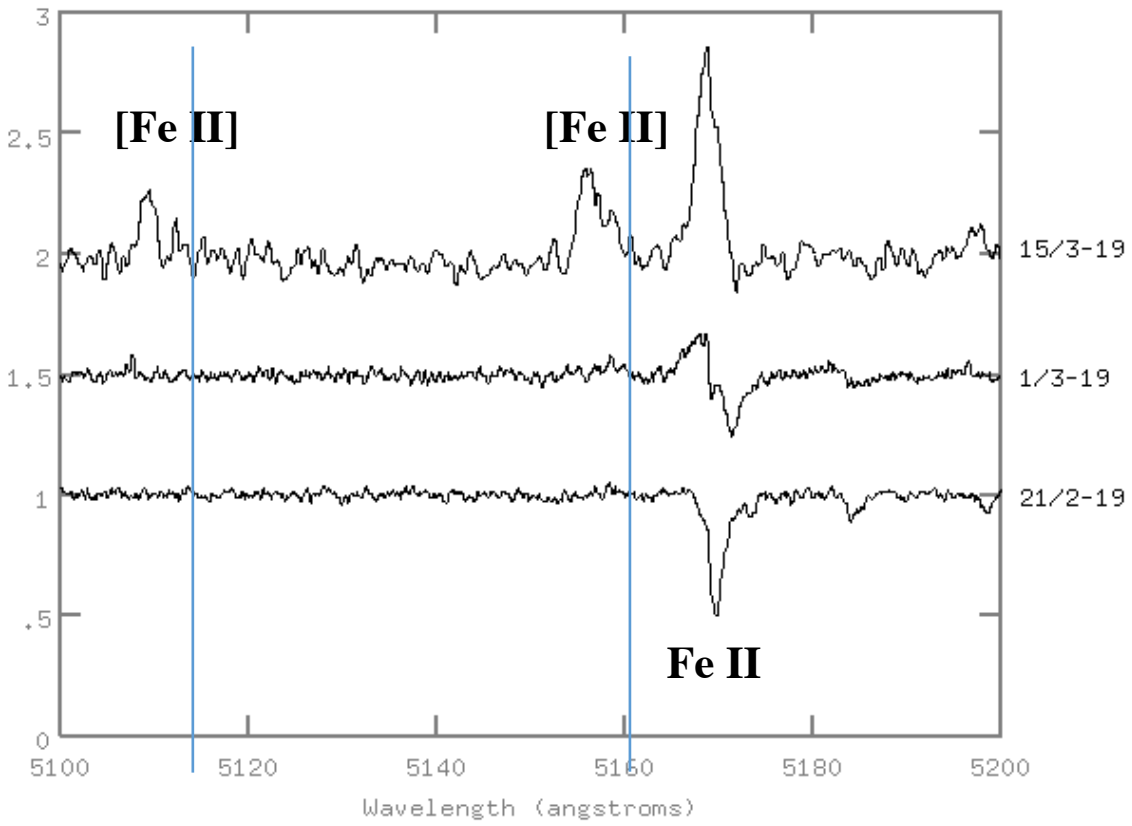


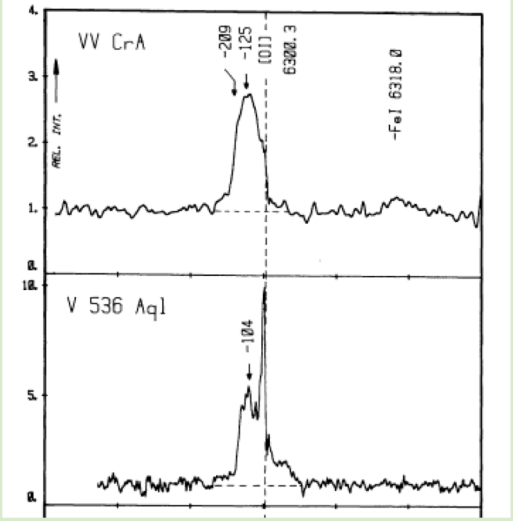


Contrast effect: the line FLUX is very constant

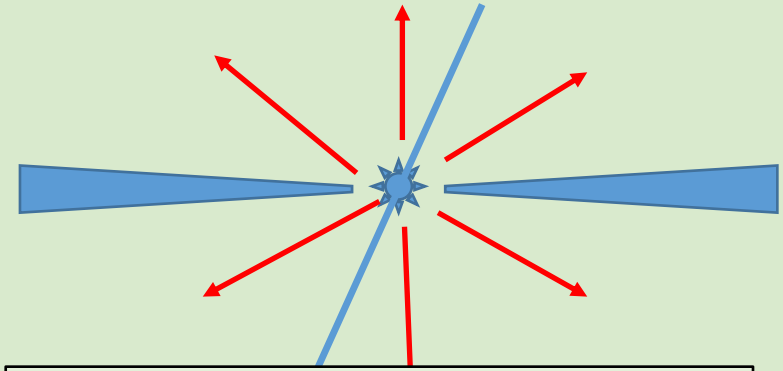
RV = 0.0 km/s. RV star: +11 km/s ?
ΔV = 58.1 km/s (FWHM)

RR Tau 2019





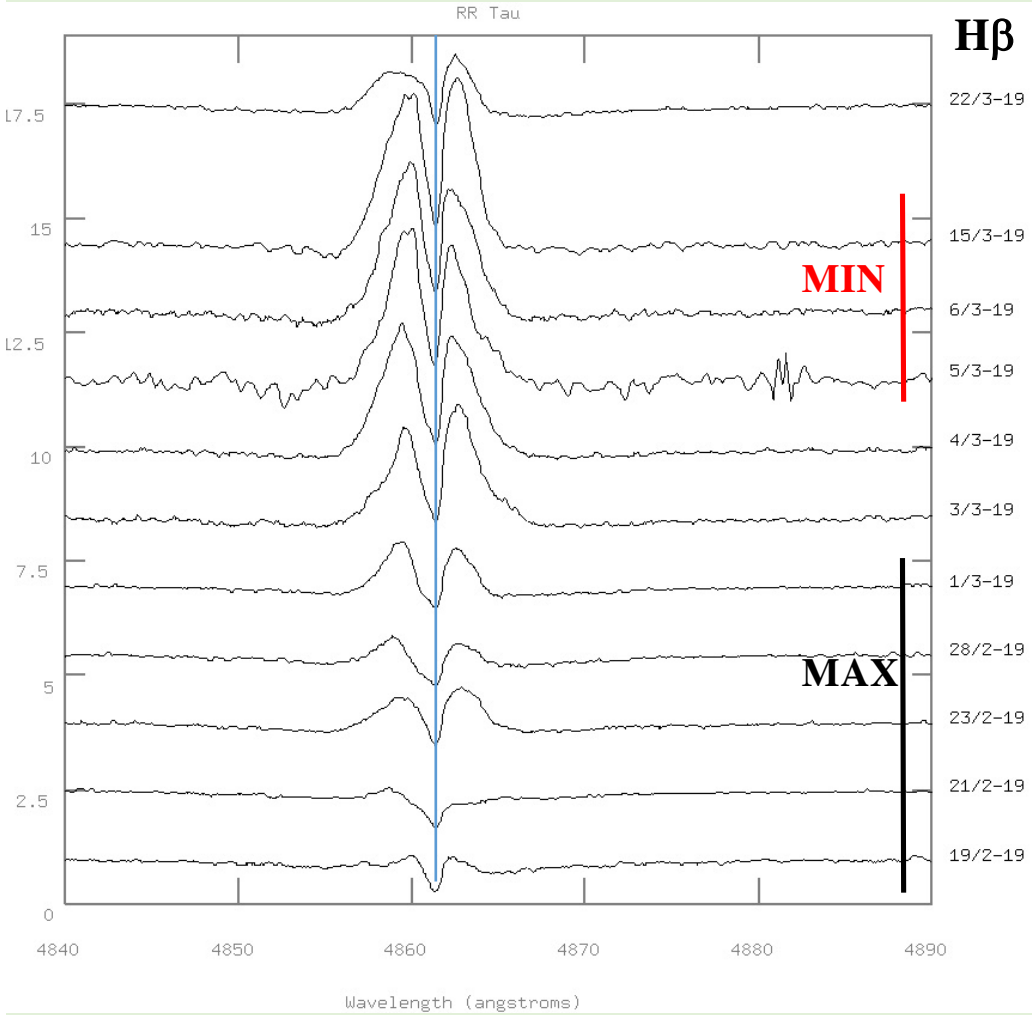
[S II] lines
Appenzeller+ (1984)

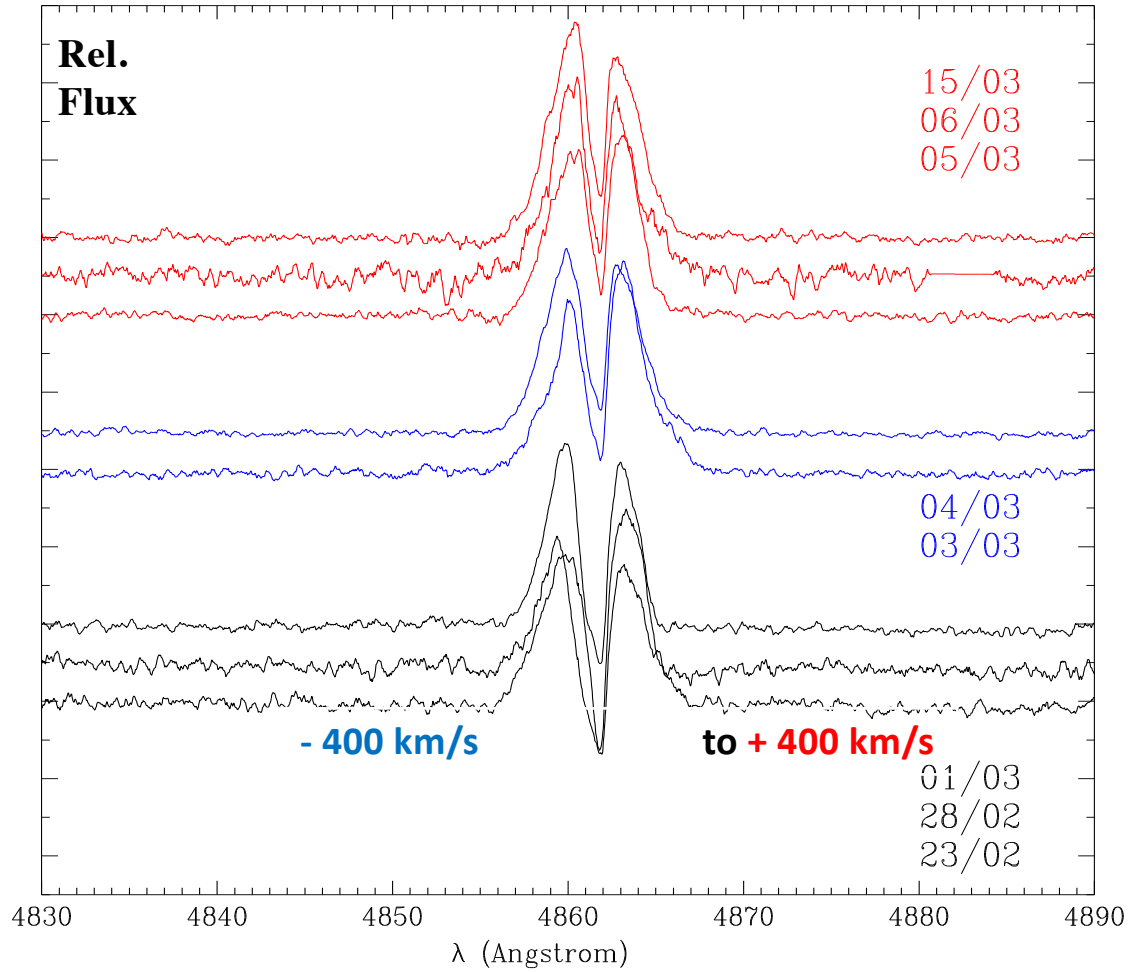


[Fe II]: higher critical density than [S II]

Q4: Is the RR Tau disk tilted? **Confirmation? ALMA**

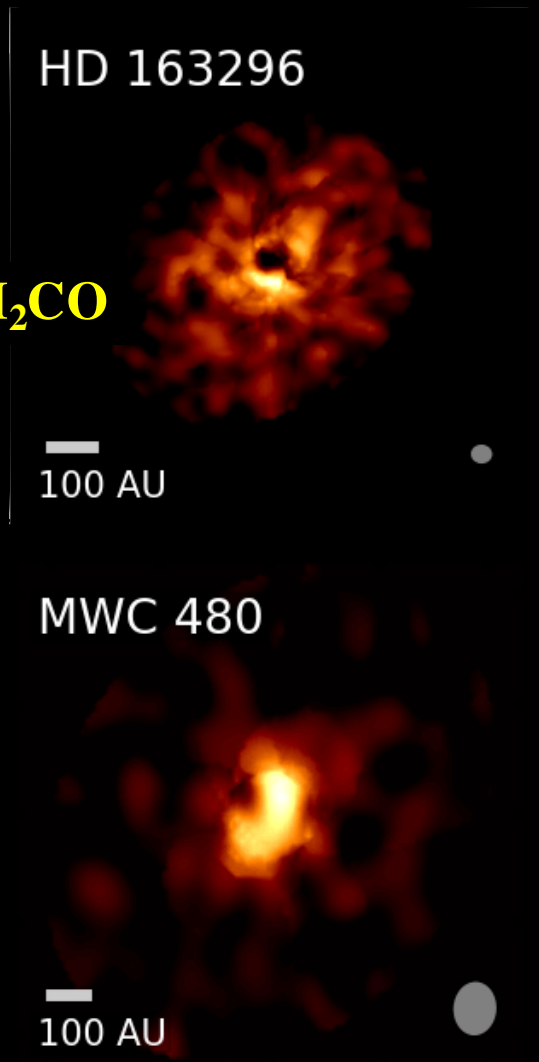
RR Tau2019

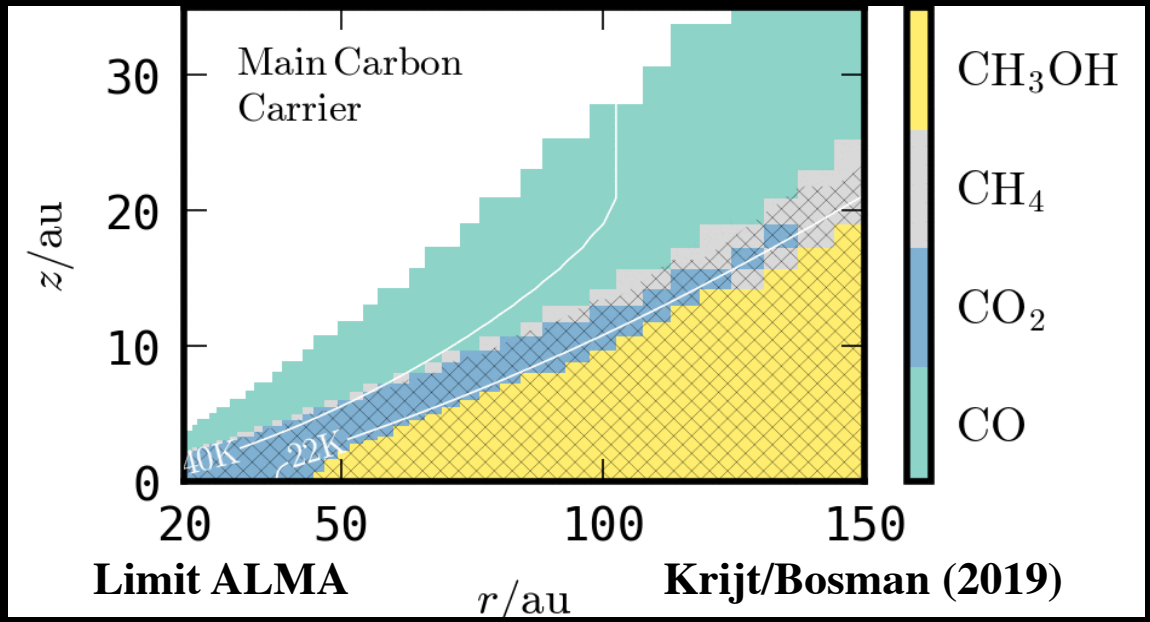




Intrinsic variations: difficult to map inner region

Rodgers et al.





Q5: Any UXORs with ALMA ?

ANY MOLECULAR LINES IN THE LINEOFSIGHT ?

First test if DIBs are enhanced in UX-objects when occulted:
Andersen, Gahm, Krelowski (1982) for HR 5999
Result: DIBs are not enhanced.

SIGNATURES FROM COLD GAS WHEN RR TAURI IS OCCULTED ?

Species	Enhanced when occulted?	
Ca I, Mg I, K I ground state	no	
DIBs	no	(not enhanced in shells(H II)
C_2 (2 – 0), C_3	no	(enhanced in shells/H II)
CH, CH^+	no	(enhanced in shells/H II)
CN	no	
NH_2	no	
Overtune CO 2.3 μ	to be	Ilee+ (2014)
Fluorescent H_2 2.1 μ	to be	

Open questions

Q1: Rapid colour flips in UXORs?

Q2: How to bring large bodies with large dust grains far above the disk?

Q3: Evidence of spectroscopic binaries?

Q4: Is the RR Tau disk tilted? Size of inner holes?

Q5: Any mapping of UX Ori stars with ALMA?

Q6: Detecting which molecules in the sightline?