Poster Blitz #4

1. Banzatti, A.
2. Birnstiel, T.
3. Carmona, A.
4. Dougados, C.
5. Gonzalez, J.-F.
6. Kamp, I.
7. Kluska, J.
8. Lambrechts, M.
9. Maaskant, K.
10. Mathews, G.
11. McClure, M.
12. Mulders, G.

EX Lupi from Quiescence to Outburst: Opening a New Window on Chemistry and Dynamics of Volatile Species in Planet-Forming Circumstellar Disks.

Presenter: A. Banzatti, Institute of Astronomy, ETH Zurich, Switzerland

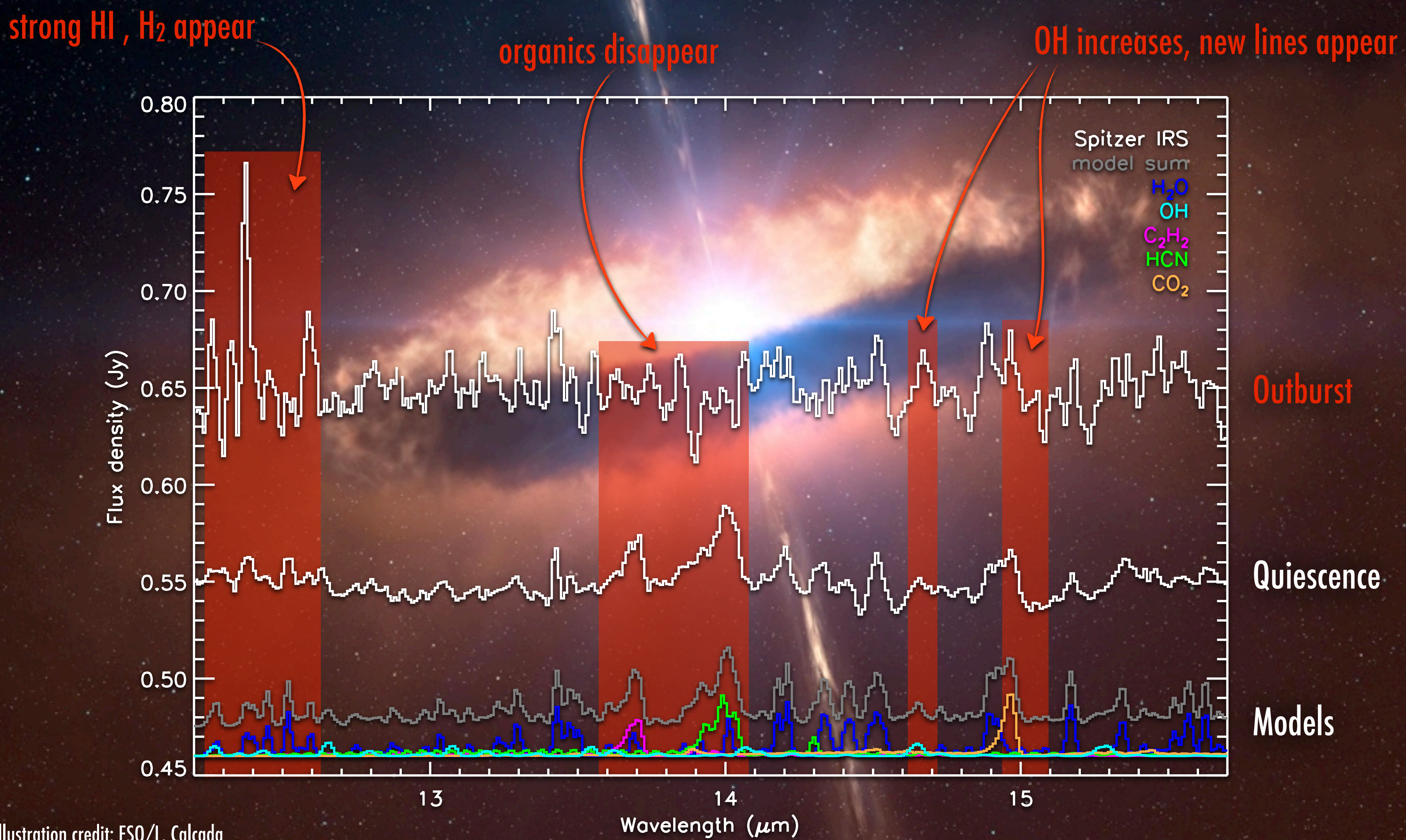


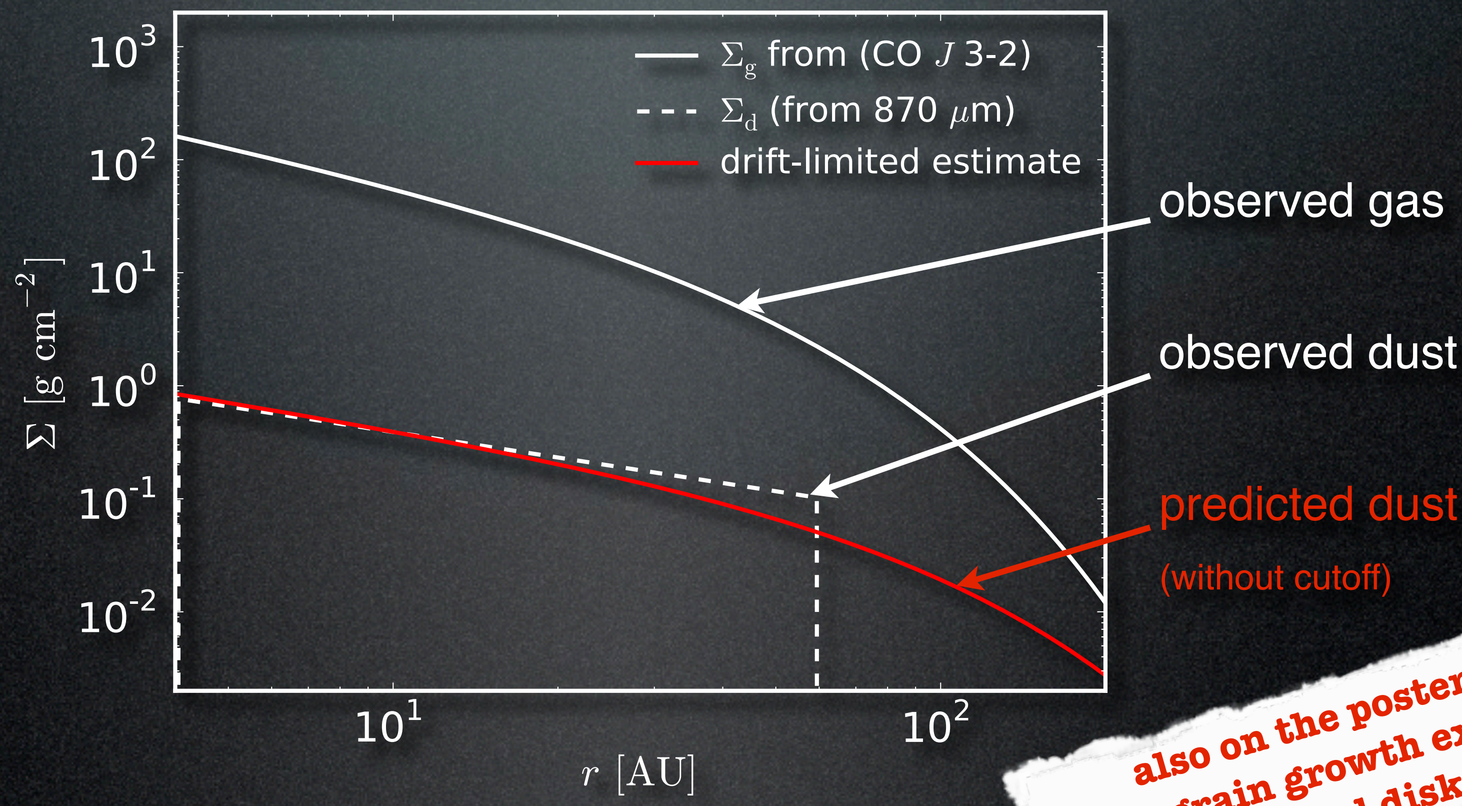
Illustration credit: ESO/L. Calçada

Observable Signatures of Dust Evolution

T. Birnstiel, S. Andrews, B. Ercolano, H. Klahr

radial drift $\Rightarrow$ $\Sigma_{\mathrm{dust}} \propto r^{-0.75}$ effective in outer regions, see figure

fragmentation $\Rightarrow$ $\Sigma_{\mathrm{dust}} \propto r^{-1.5}$ effective in inner regions $\Rightarrow$ MMSN

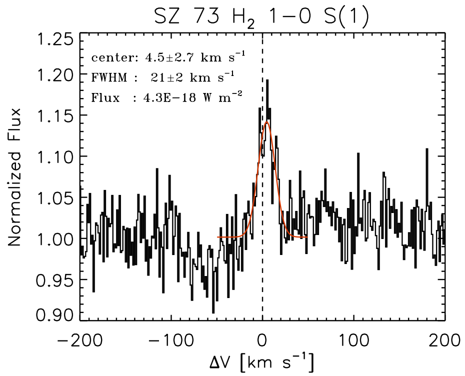


also on the poster:
„Can grain growth explain transitional disks?“

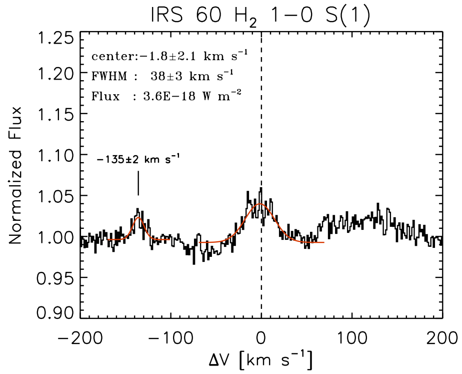
Employing H2 near-IR lines to understand the circumstellar environment of sources with Spitzer [Ne II] 12.8 micron emission

A. Carmona (Grenoble), M. Audard (Geneva), C. Baldovin-Saavedra (Geneva), M. Güdel (Vienna), J. Bary (Colgate)

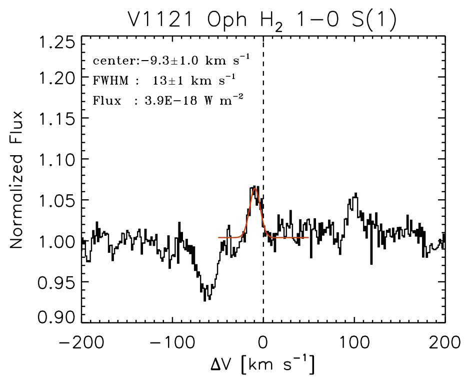
disk

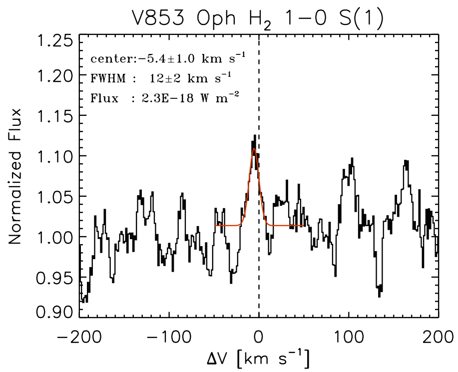


disk + high vel. outflow



low velocity outflow

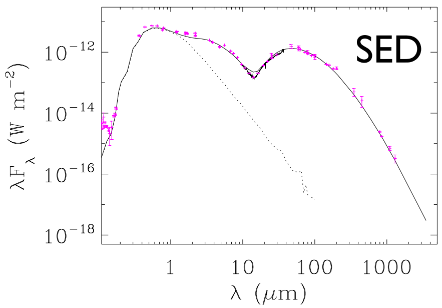


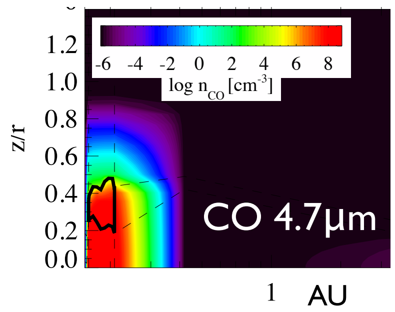


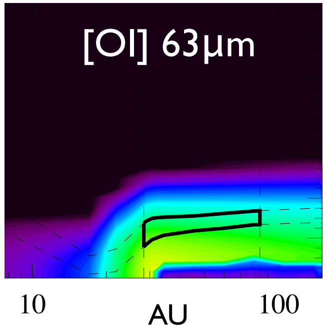
- ★ What is circumstellar environment of the sources with Spitzer [Ne II] emission?
- ★ Ongoing CRIRES R~90000 survey for H2 near-IR emission in sources with the [Ne II] line
- ★ 8 of 18 objects observed: 4 detections H2 1-0 S(1) line

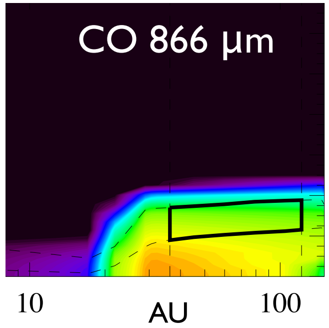
Simultaneous modeling of gas and dust diagnostics in the circumstellar disk of HD135344B

A. Carmona (Grenoble), C. Pinte (Grenoble), W.F. Thi (Grenoble), M. Benisty (Grenoble), F. Menard (Grenoble) + GASPS collaboration









MCFOST ⟷ PRODIMO

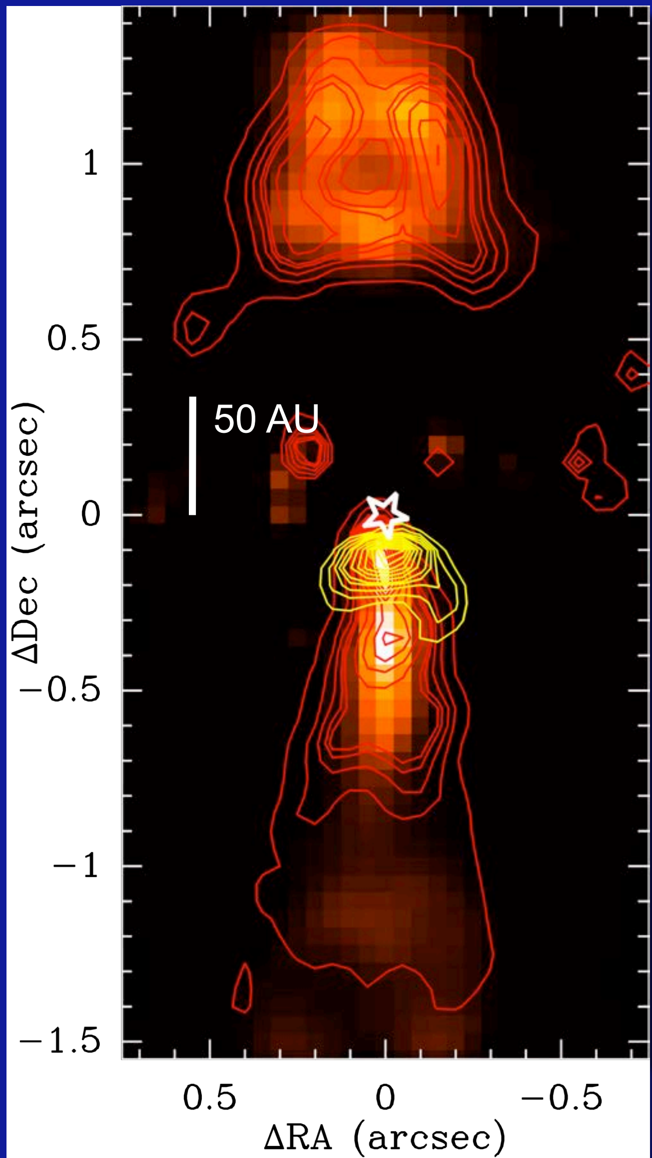
- ★ Goal: employ multi-instrument observations of gas and dust of HD 135344B and constrain its disk structure.
- ★ Present status: found a model with similar SED, PAH spectrum, and line fluxes for the CO 4.7μm, [OI] 63 μm, and CO 866 μm emission.
- ★ To be included: near-IR interferometry, imaging, fit to the line profiles and other molecules detected.

SINFONI/VLT observations of the DG Tauri microjet

Receding jet

Star position

Approaching jet



Background colors and red contours:
[Fe II] atomic flow

Yellow contours: H_2 1-0 S(1) emission

★ Continuum

- **Dusty atomic flow**
- **Slow molecular cavity**

Agra-Amboage, Dougados, Cabrit et al 2011

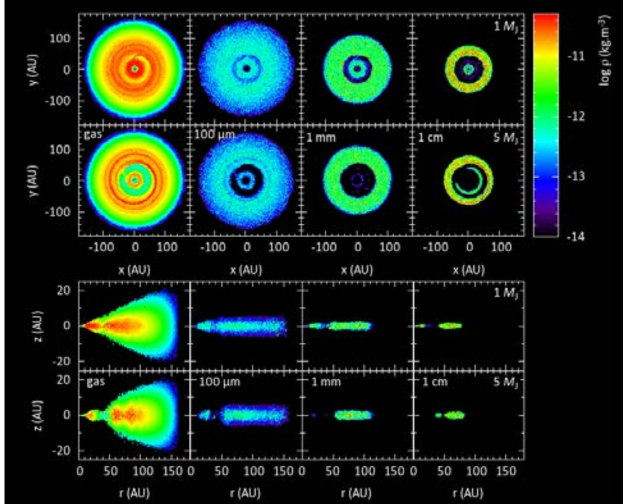
Agra-Amboage, Cabrit, Dougados in prep.

Planet Gaps in the Dust Layer of 3D Protoplanetary Disks

Observability with ALMA

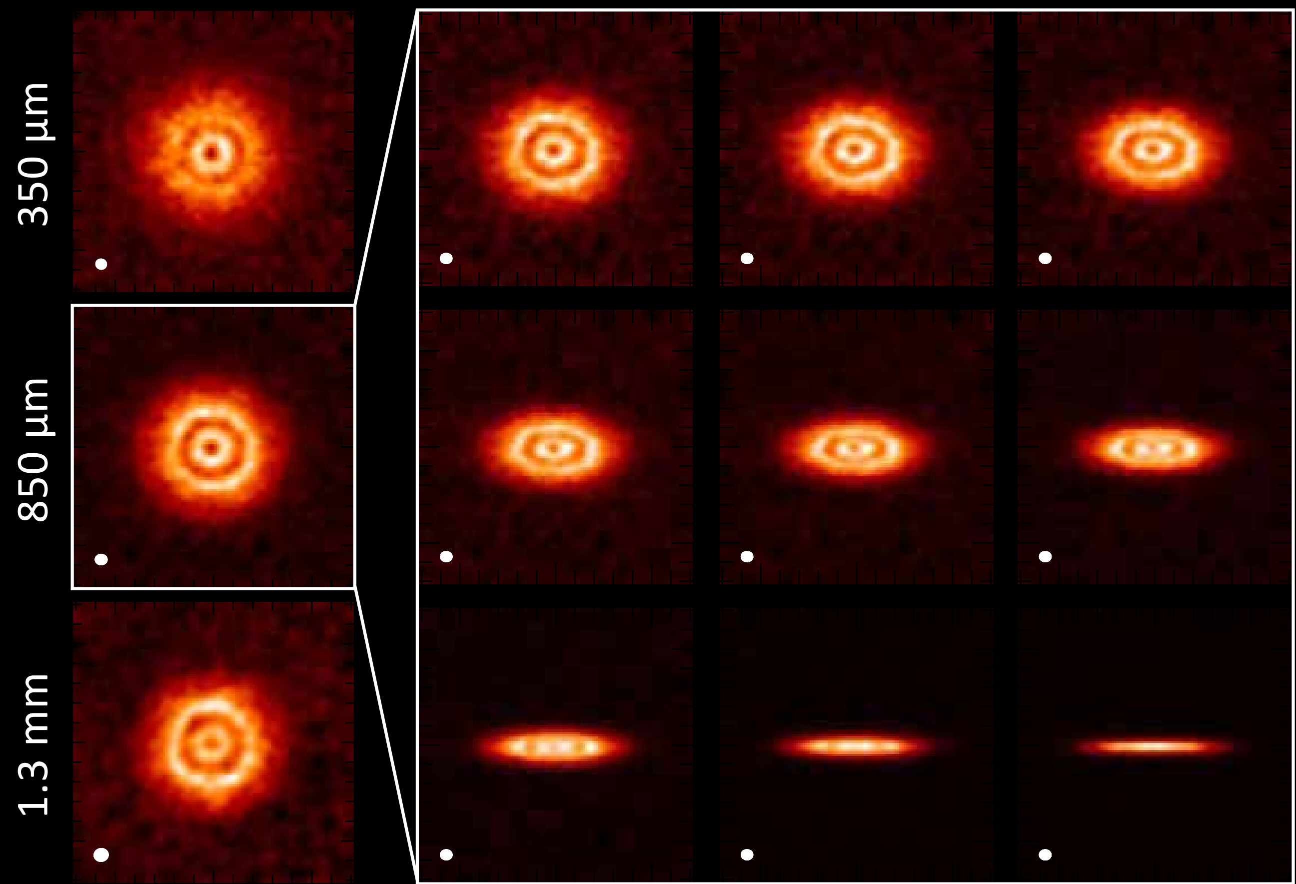
Jean-François Gonzalez[1] , Christophe Pinte[2] , Sarah Maddison[3] , François Ménard[2], Laure Fouchet[4]

Hydrodynamic simulations of planet gaps in dusty disks



MCFOST
+
CASA

ALMA Simulated Images



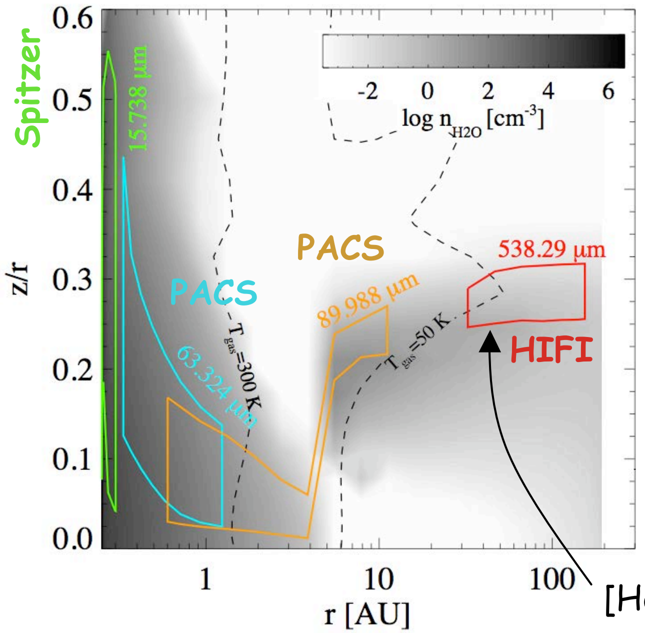
TW Hya
A dry desert or a steam bath?

Kapteyn Instituut RuG

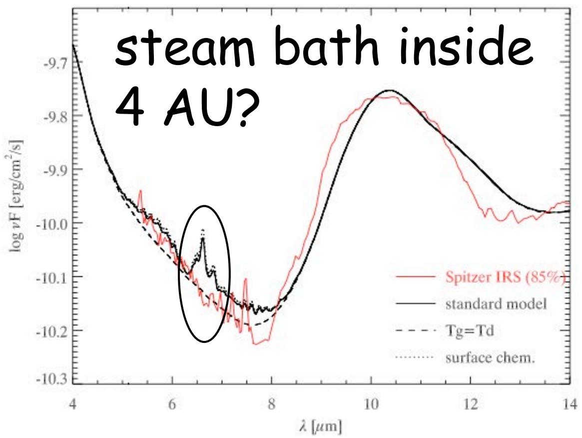
I.Kamp, W.-F.Thi, G.Meeus, P.Woitke, I.Pascucci, B.Dent

Basic model from Thi et al. 2010, updated reaction rates, H_2O surface chemistry

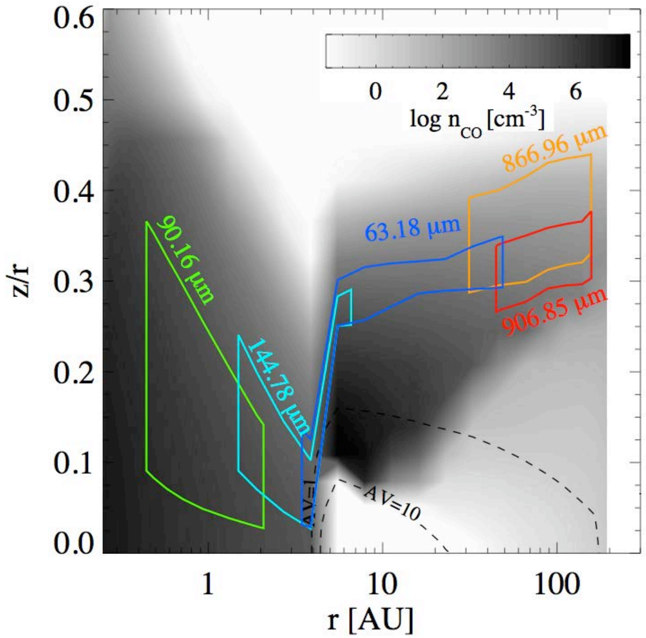
What do the different Herschel lines tell us?



[Hogerheijde et al. 2012]



H_2O ro-vib & rotational lines



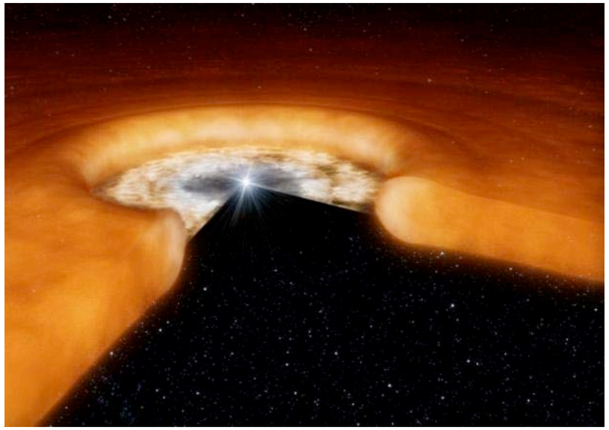
=> one model can still fit all line fluxes within a factor two

=> need for multi-λ studies to unravel the full gas+dust disk structure

=> HCO^+ and [FeII] require very gas phase metal abundances below ISM value

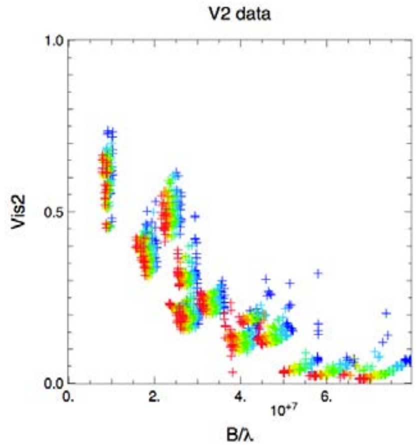
Observations and images of Young Stellar Objects at the milli-arcsecond scale: the case of MWC158

J. Kluska, F. Malbet, J.-P. Berger, M. Benisty, B. Lazareff, J.-B. Lebouquin



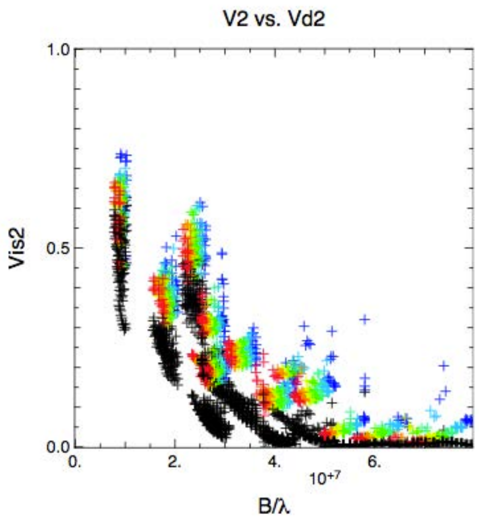
Young Stellar Objects &
Milli-arcescond Imaging

Problem :
Strong spectral dependance !

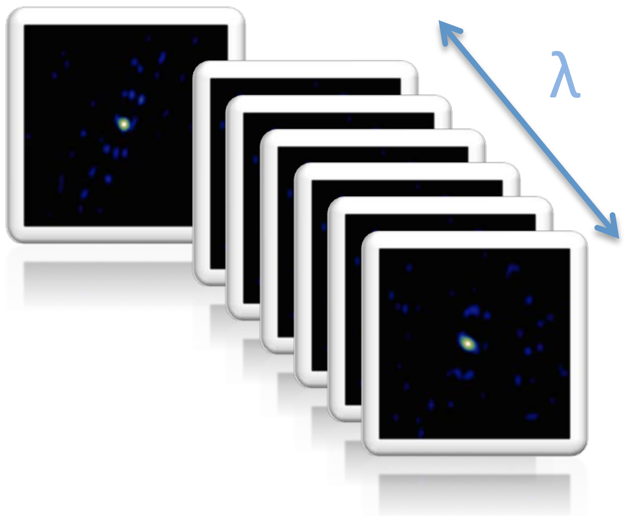


Three methods are presented :

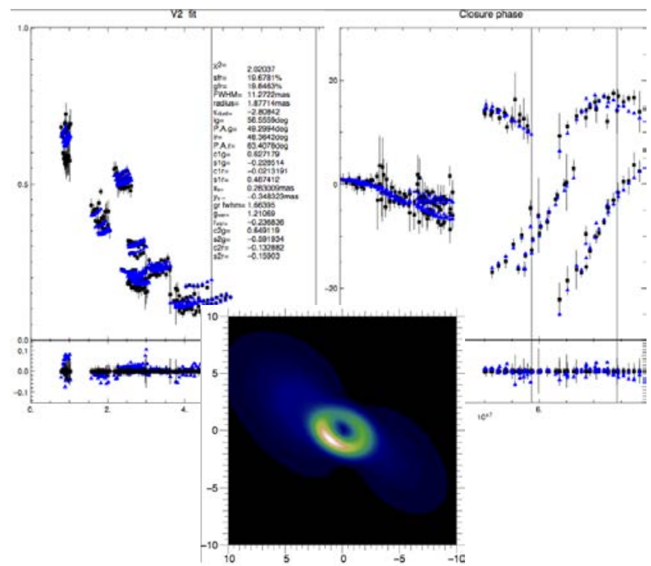
1. Removing the stellar contribution



2. Using the wavelengths separately

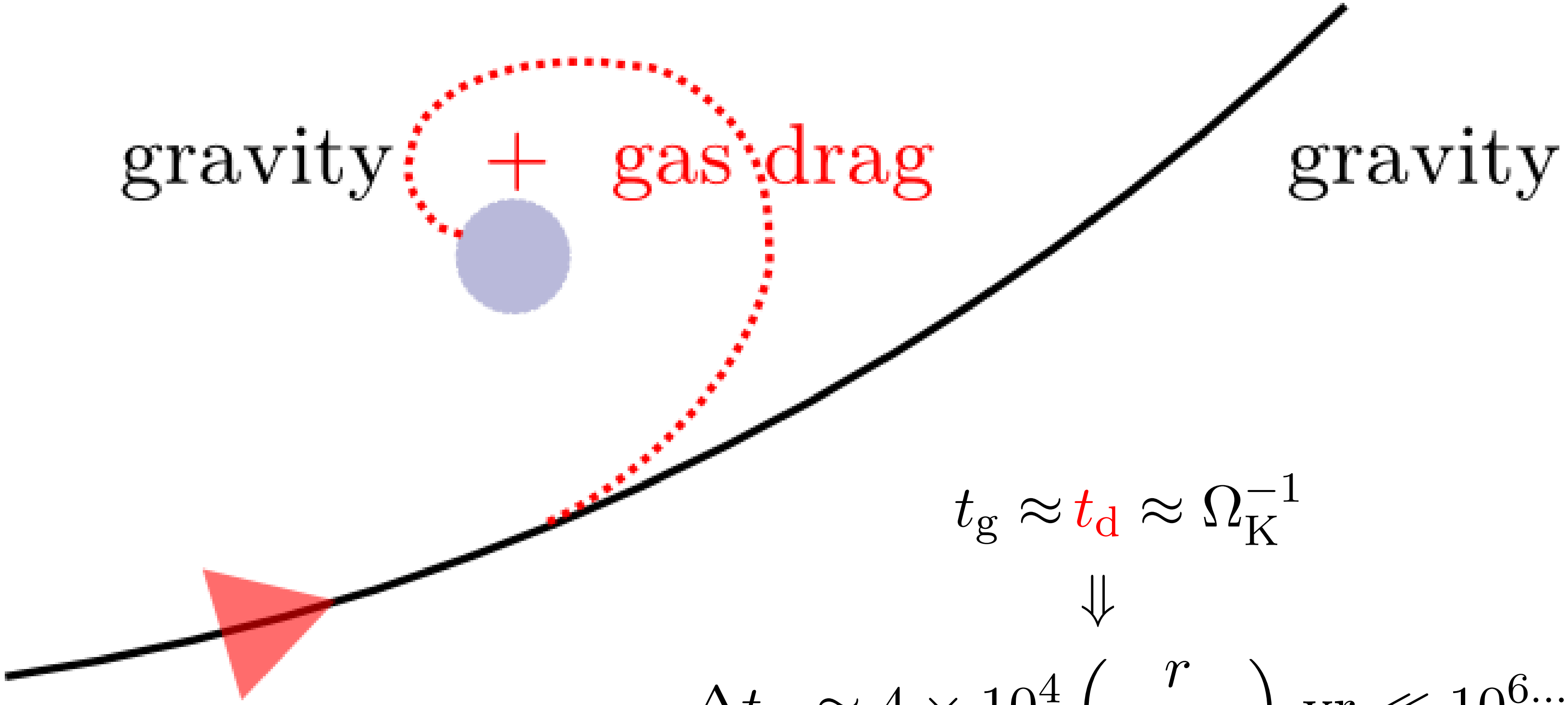


3. Parametric fit



Rapid growth of gas-giant cores by *pebble* accretion

Michiel Lambrechts & Anders Johansen
Lund Observatory



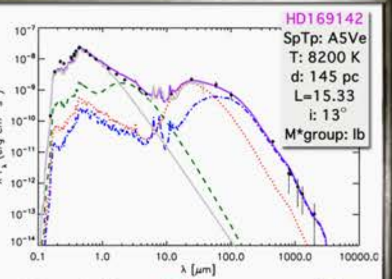
$$t_{\mathrm{g}} \approx t_{\mathrm{d}} \approx \Omega_{\mathrm{K}}^{-1}$$

$$\Downarrow$$

$$\Delta t_{\mathrm{H}} \approx 4 \times 10^{4} \left(\frac{r}{5\,\mathrm{AU}}\right) \mathrm{yr} \ll 10^{6\ldots7}\,\mathrm{yr}$$

The transitional disk of HD169142

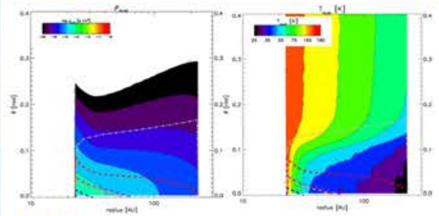
Measuring the gap size



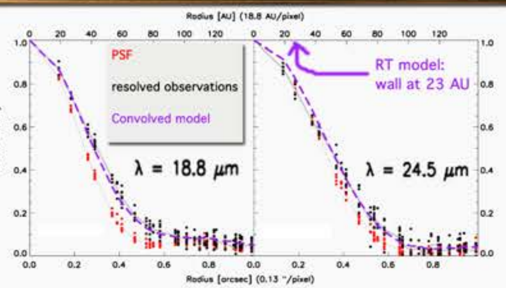
***SED:** halo, wall (@23AU), outer disk*

The disk around the Herbig Ae star HD169142 was imaged and resolved at 18.8 and 24.5 micron using Subaru/COMICS. We interpret the observations using a 2D radiative transfer model and find evidence for the presence of a large gap. The MIR images trace dust that emits at the onset of the strong rise in the spectral energy distribution (SED) at 20 micron, therefore are very sensitive to the location and characteristics of the inner wall of the outer disk and its dust. We determine the location of the wall to be 23 AU from the star. An extra component of hot dust must exist close to the star. We find that a hydrostatic optically thick inner disk does not produce enough flux in the NIR and an optically thin geometrically thick component is our solution to fit the SED. Considering the recent findings of gaps and holes in a number of Herbig Ae/Be group I disks, we suggest that such disk structures may be common in group I sources. Classification as group I should be considered a support for classification as a transitional disk, improved imaging surveys are needed to support this speculation. *(ApJ submitted)*

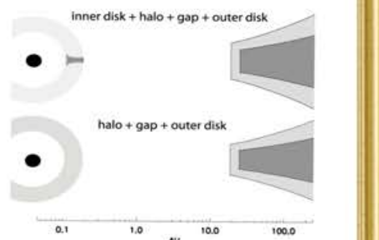
M. Honda, Koen Maaskant Y. K. Okamoto, H. Kataza, M. Fukagawa, L. B. F. M. Waters, C. Dominik, A. G. G. M. Tielens, G. D. Mulders, M. Min, T. Yamashita, T. Fujiyoshi, T. Miyata, S. Sako, I. Sakon, H. Fujiwara and T. Onaka



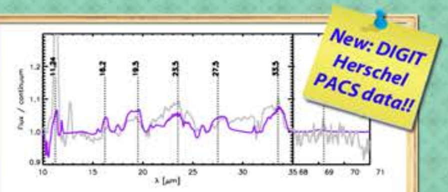
***MCMax** (radiative transfer model): density and temperature structure*



resolved Subaru/COMICS MIR images



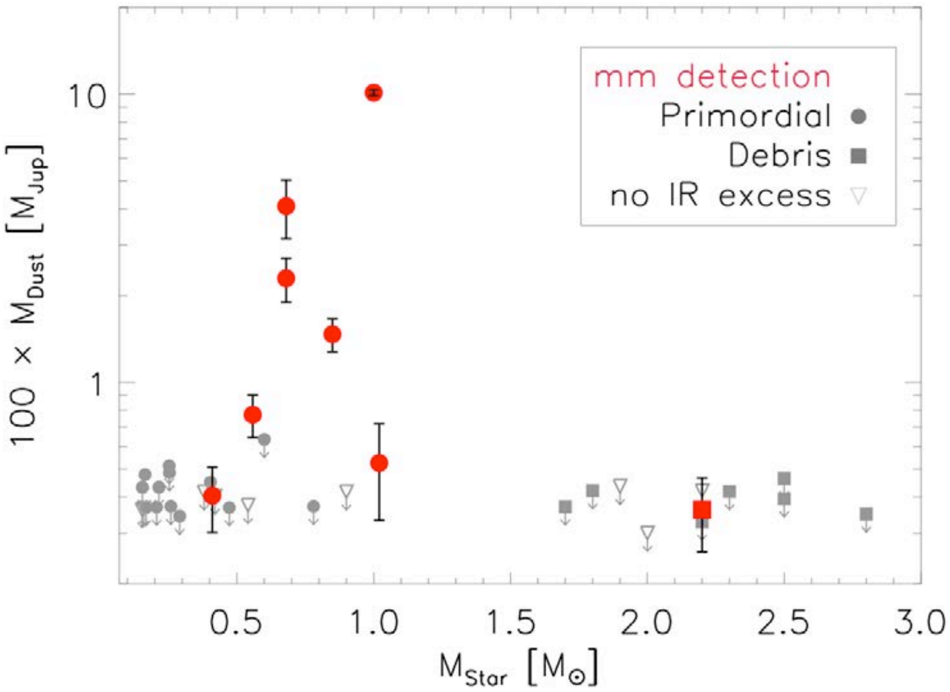
Sketch of the possible disk structures

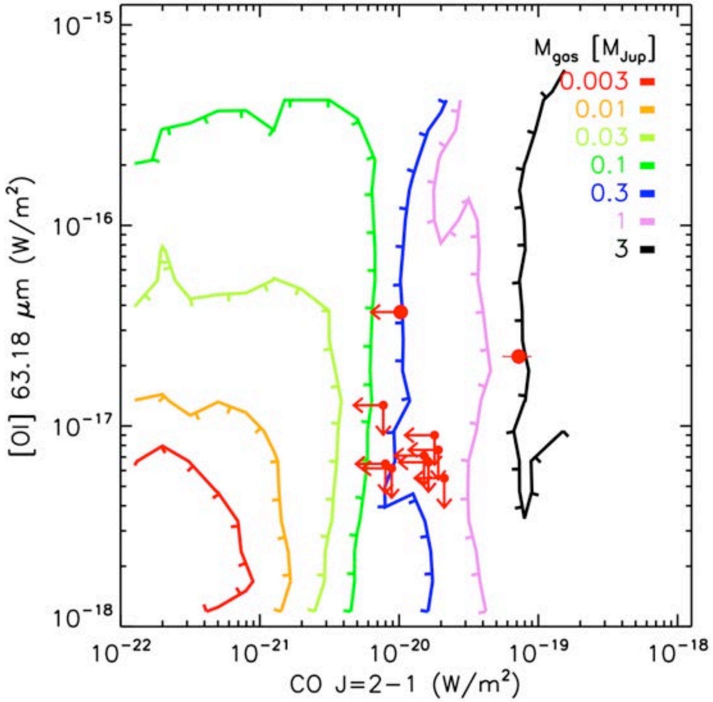


***Radiative transfer mineralogy model conclusion:** forsterite in the wall*

Few stars in Upper Scorpius have sufficient disk mass to form new giant planets

Geoff Mathews and the GASPS team



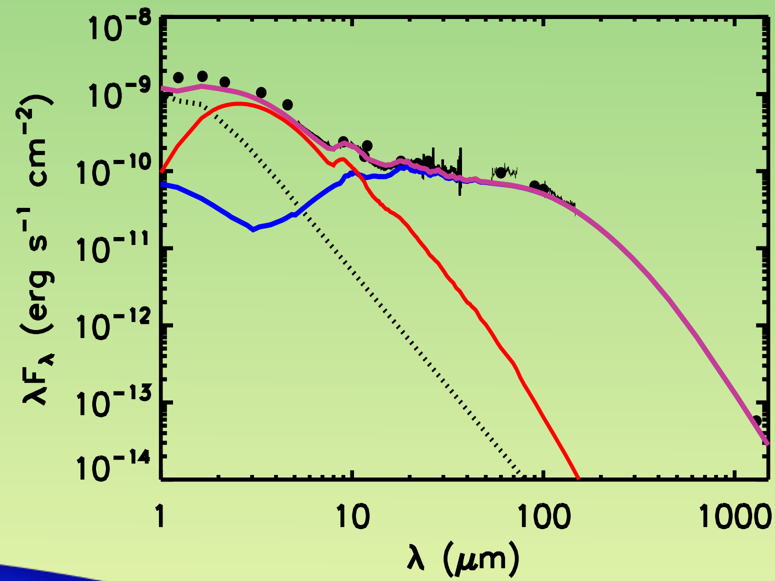


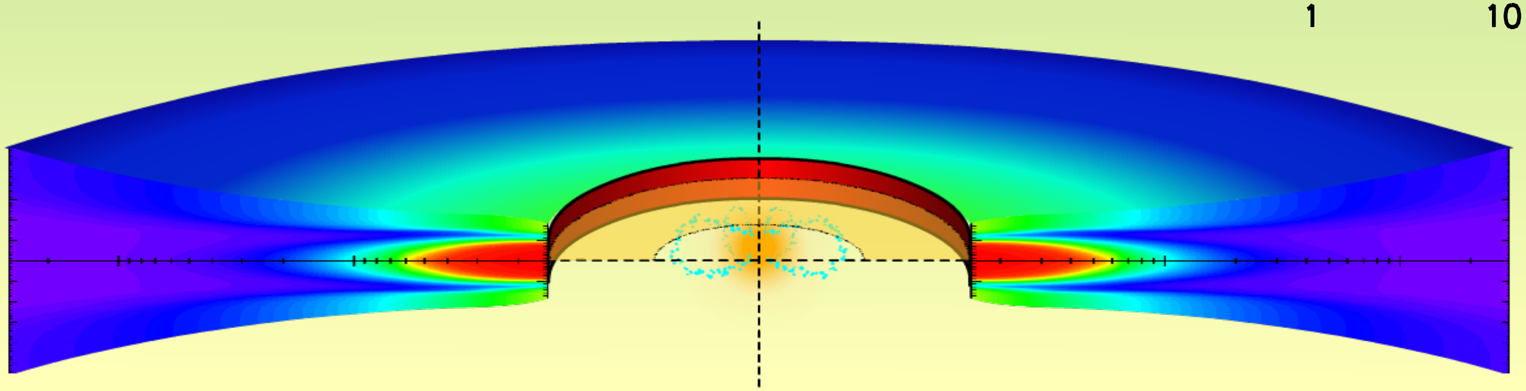
M_{dust} estimated from 1.2 and 1.3 mm photometry (Mathews et al. 2012). M_{gas} estimated by comparison of gas line fluxes to mean gas masses from the DENT grid (e.g. Woitke et al. 2010, Kamp et al. 2011).

Revealing dynamics of protoplanetary disks through the spatial distribution of crystalline dust

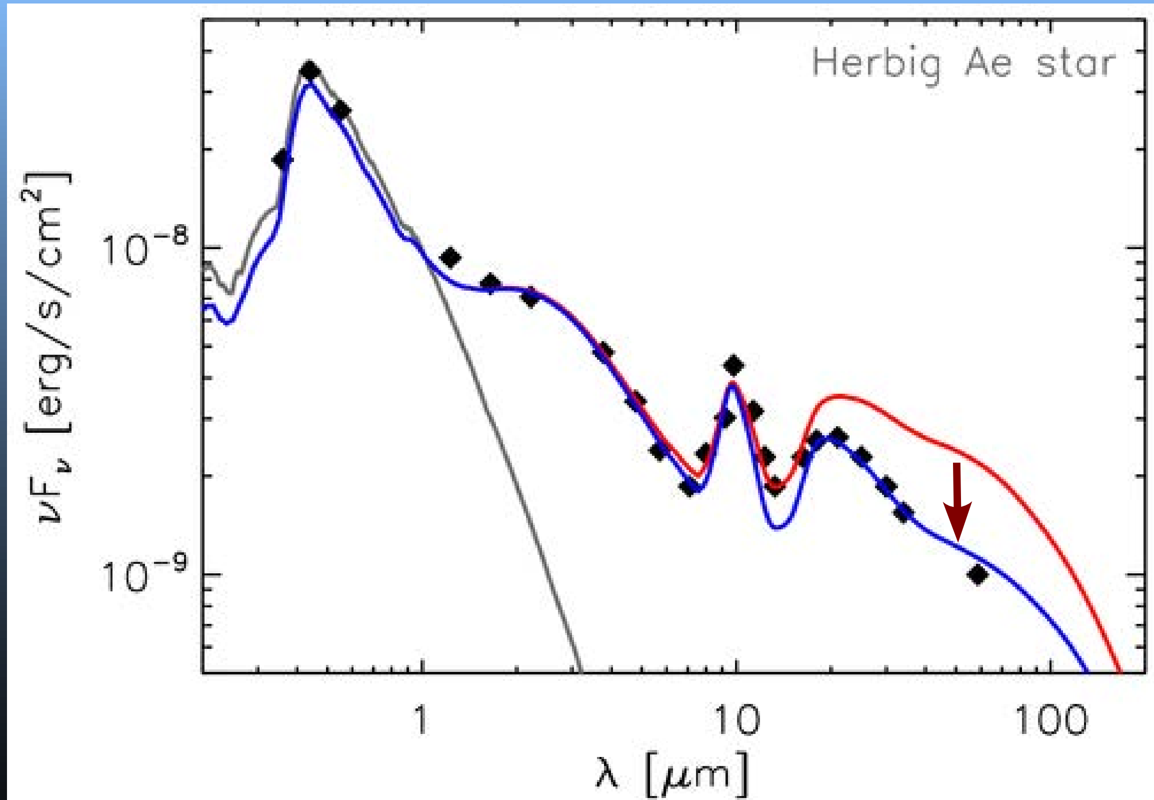
M.K.McClure, C. Espaillat, P. Manoj, N. Calvet, D. M. Watson, B. Sargent, W. J. Forrest, L. Adame, P. D'Alessio

- Self-consistent disk structure for accreting T Tauri star
- Reproduce SED & dust features and identify origin of crystalline emission
- Need low ice abundance to reproduce flux over IRS & PACS range

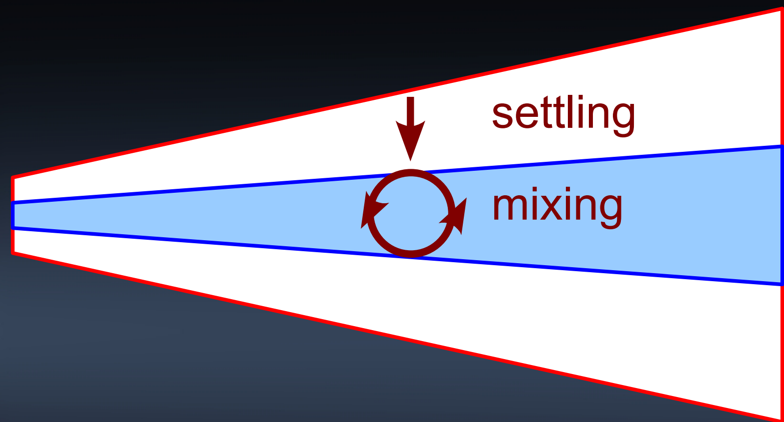




Temperature
Red = 1400 K
Purple < 100 K



Stellar-mass-independent disk structure



Thank you!