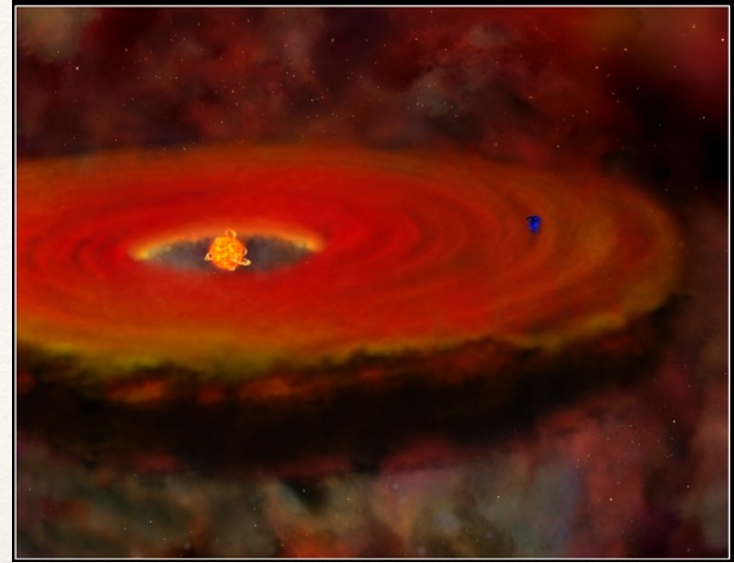
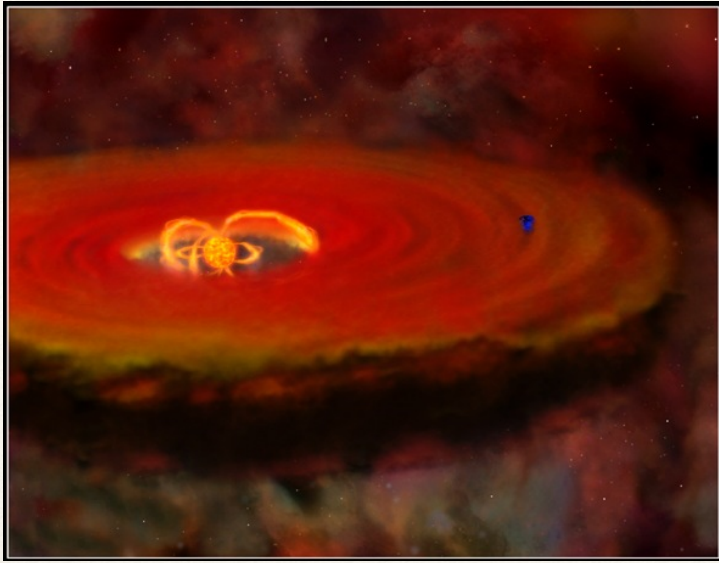


(c) NASA/CXC/M. Weiss



The end of an era?

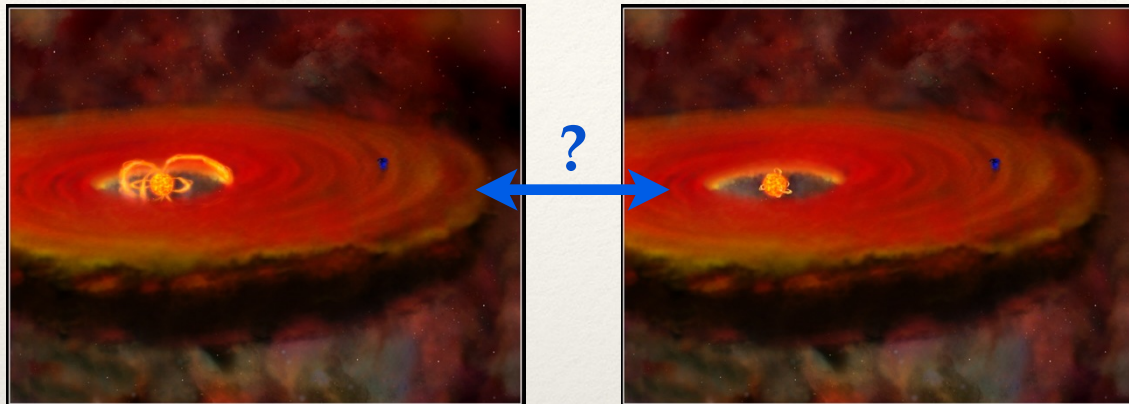
A search for flickering accretion in T Tauri stars

Gaspard Duchêne (UCB, IPAG)

Adam Becker, Tony Yang (UCB),
Hervé Bouy (CAB Madrid), Jenny Patience (ASU),
Rob de Rosa (UCB)



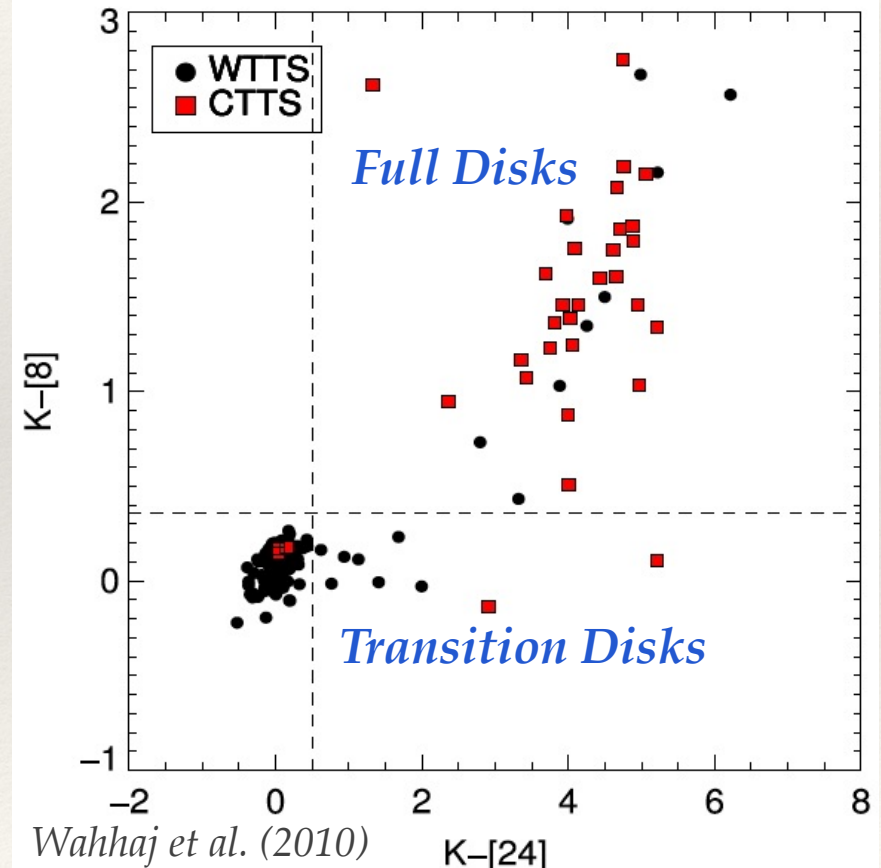
Protoplanetary disks & Accretion



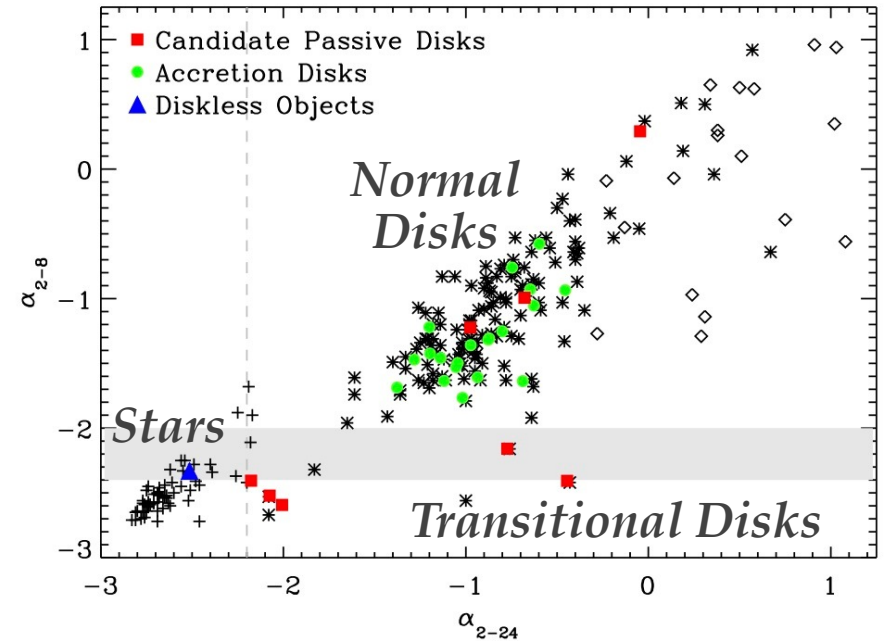
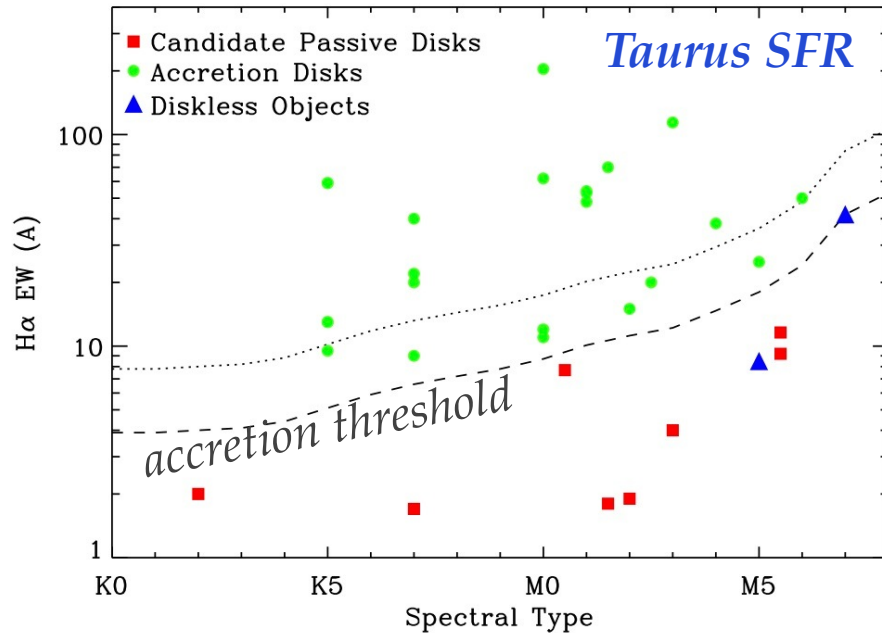
- Misclassified Weak-Line TTS?
- Intermittent accretion?
- Purely passive disks?
- **Initial stages of disk dissipation?**

Optical spectroscopic monitoring survey of accreting and apparently non-accreting T Tauri stars

Some ($\approx 10\%$) dusty disks show no accretion! Why??



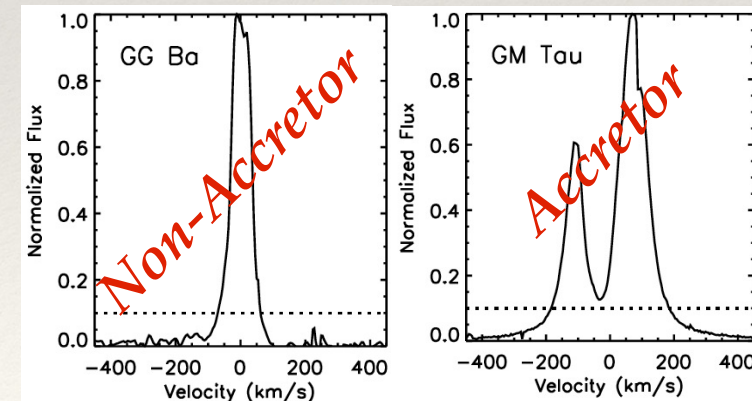
Sample, set-up and strategy



Campaign details:

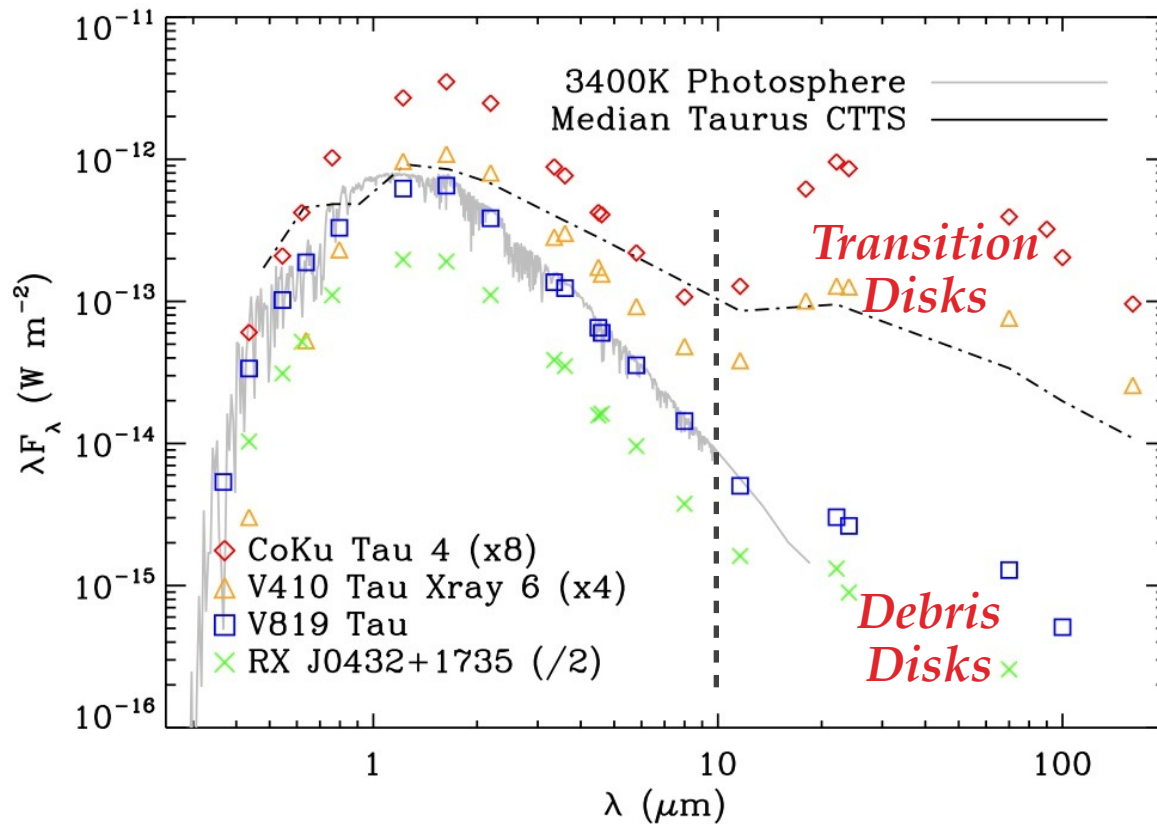
2-4m telescopes
R~2,000-5,000 spectra
8-12 epochs/target
1 day $\leq \Delta t \leq$ 13 months

Primary diagnostic:
H α 10% width ($W_{10\%}$)

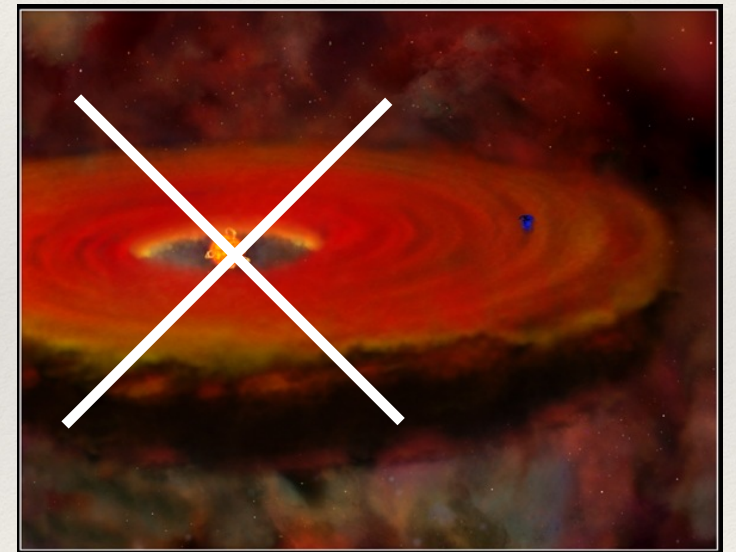


White & Basri (2003)

No continuous passive disk!

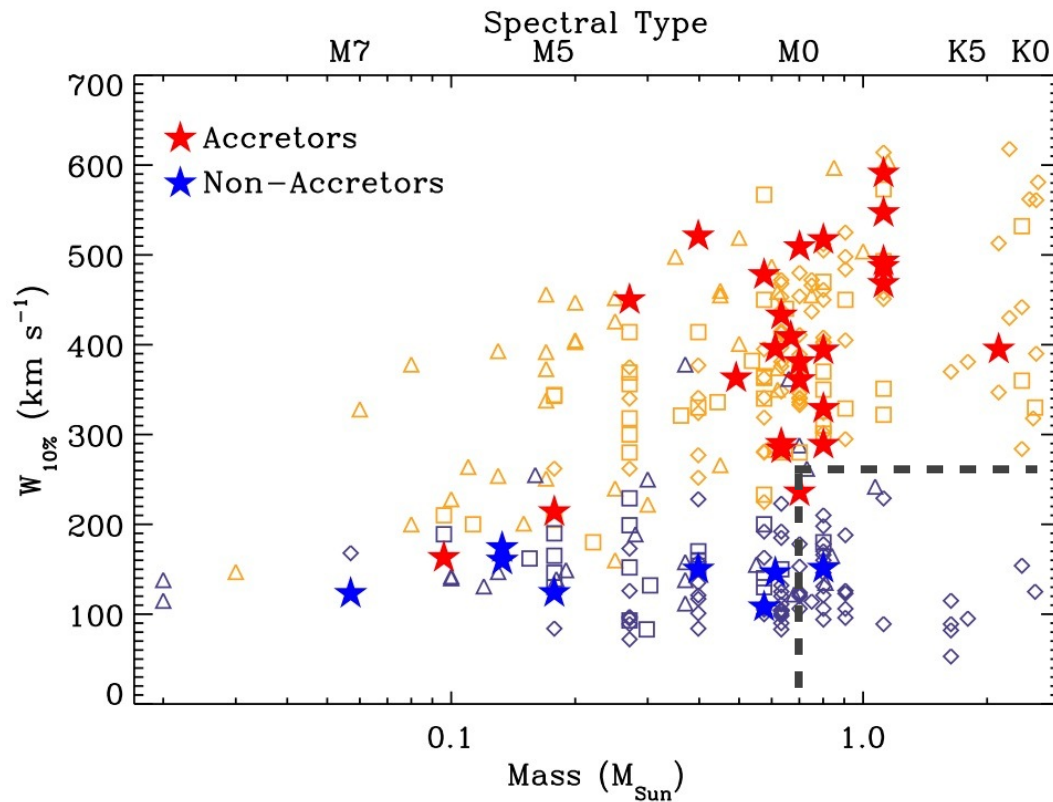


Fast inner disk dissipation
of both dust and gas

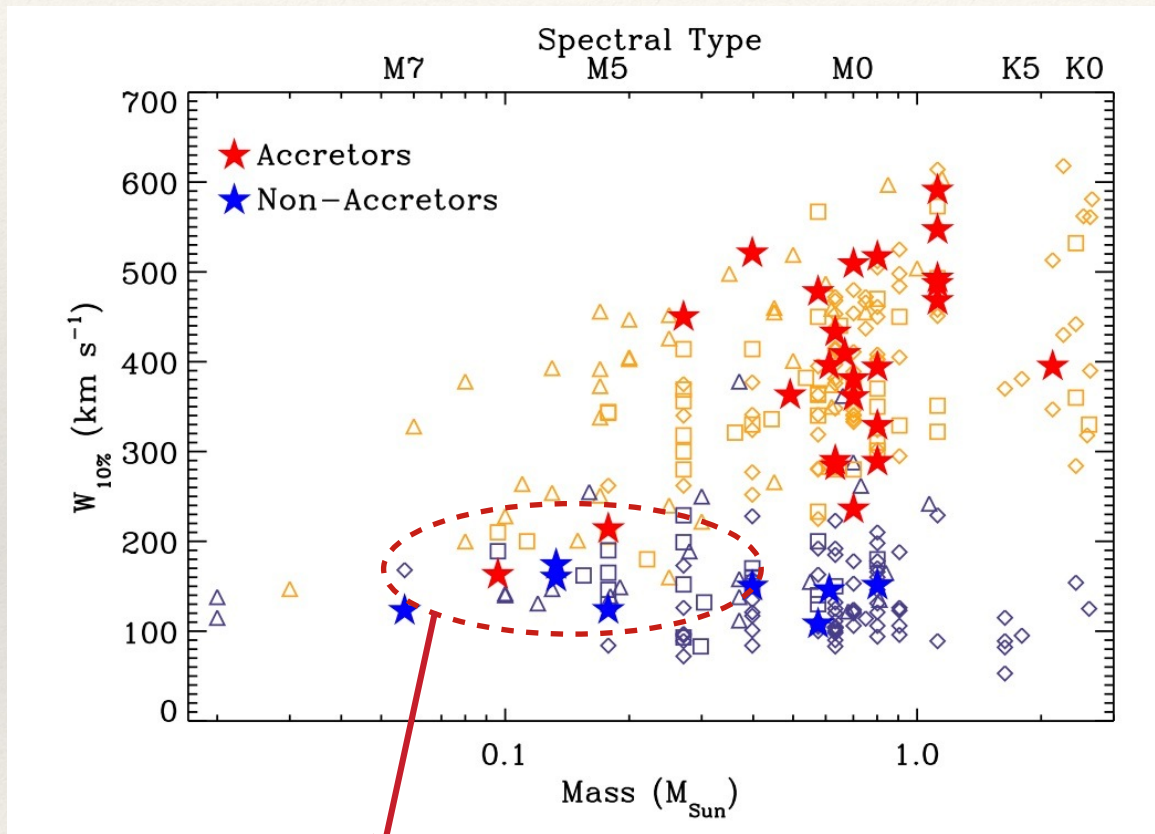


Several impostors: weak-but-broad-and-variable lines, multiple systems

Does $W_{10\%}$ probe the accretion rate?

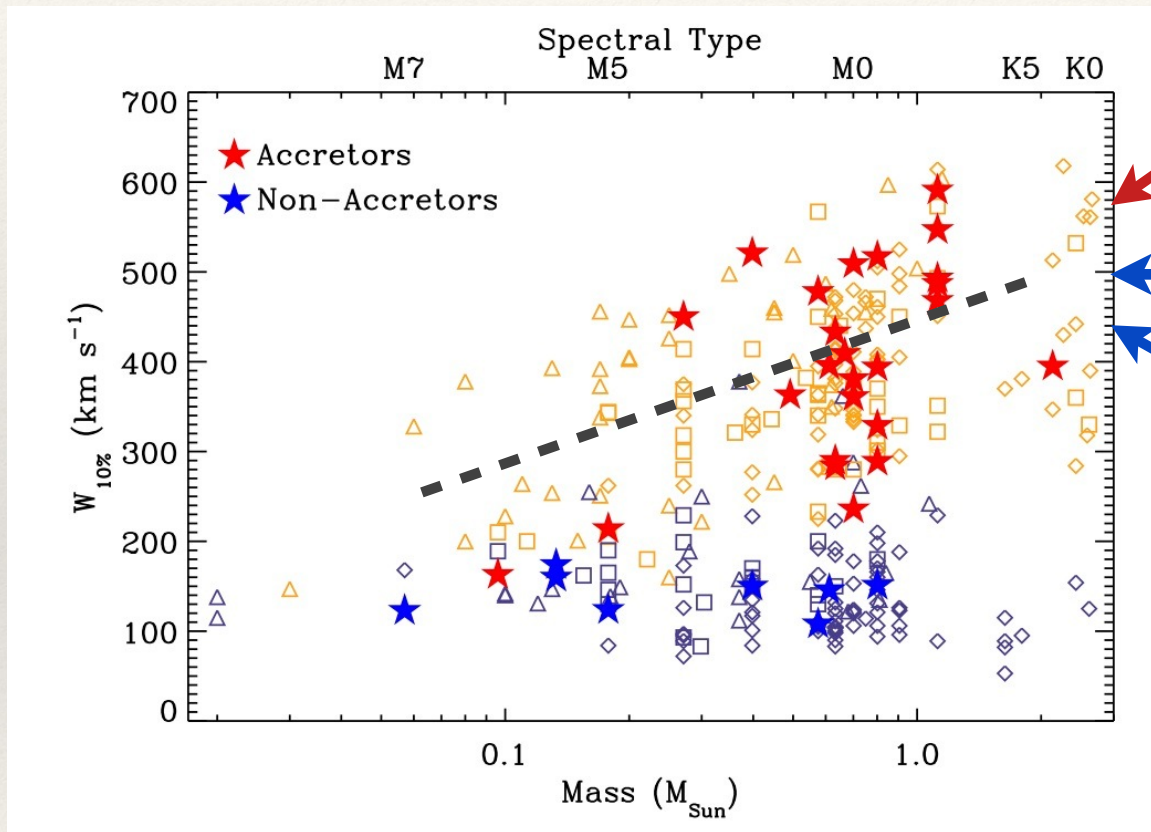


Does $W_{10\%}$ probe the accretion rate?



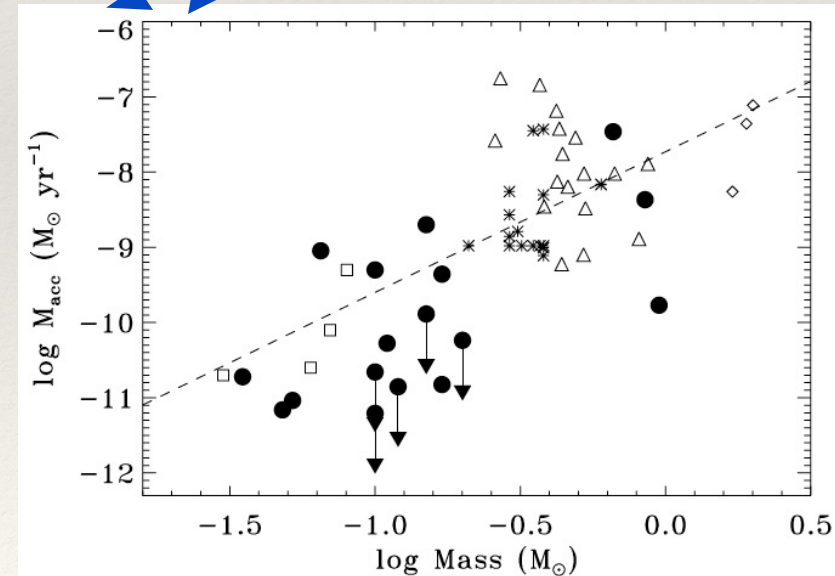
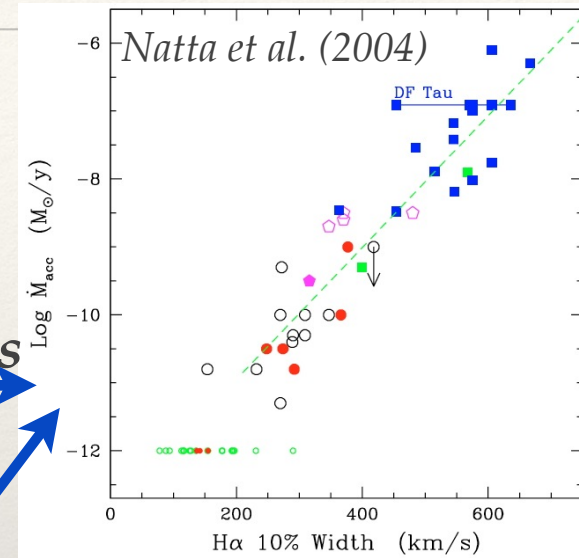
$W_{10\%}$ is an ambiguous criterion
for low-mass TTS

Does $W_{10\%}$ probe the accretion rate?



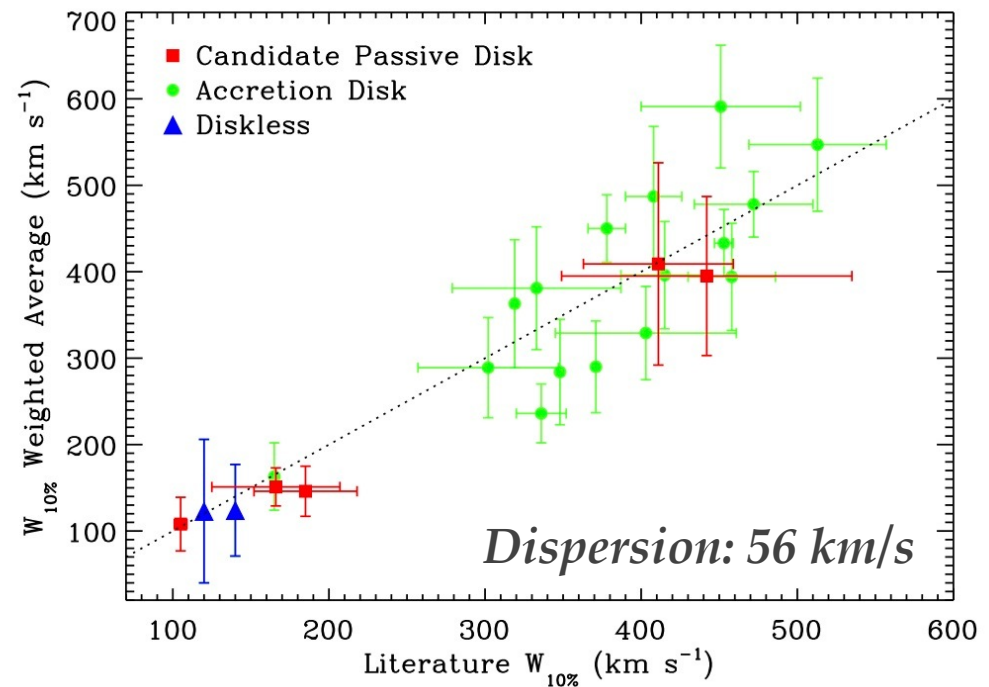
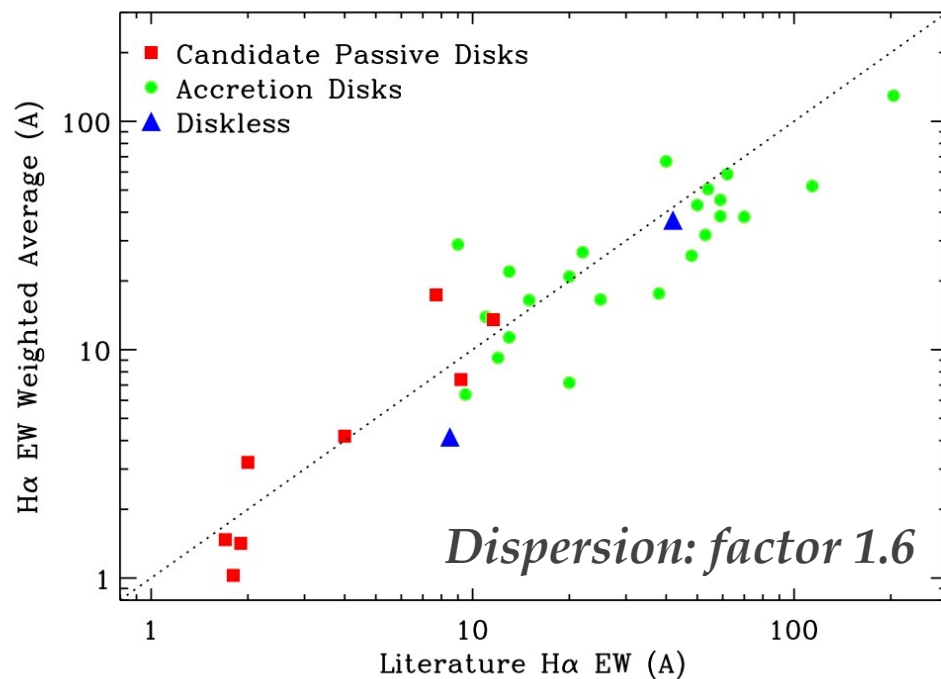
Free-fall velocity?

Which one is physical?



Time variability: Secular trend

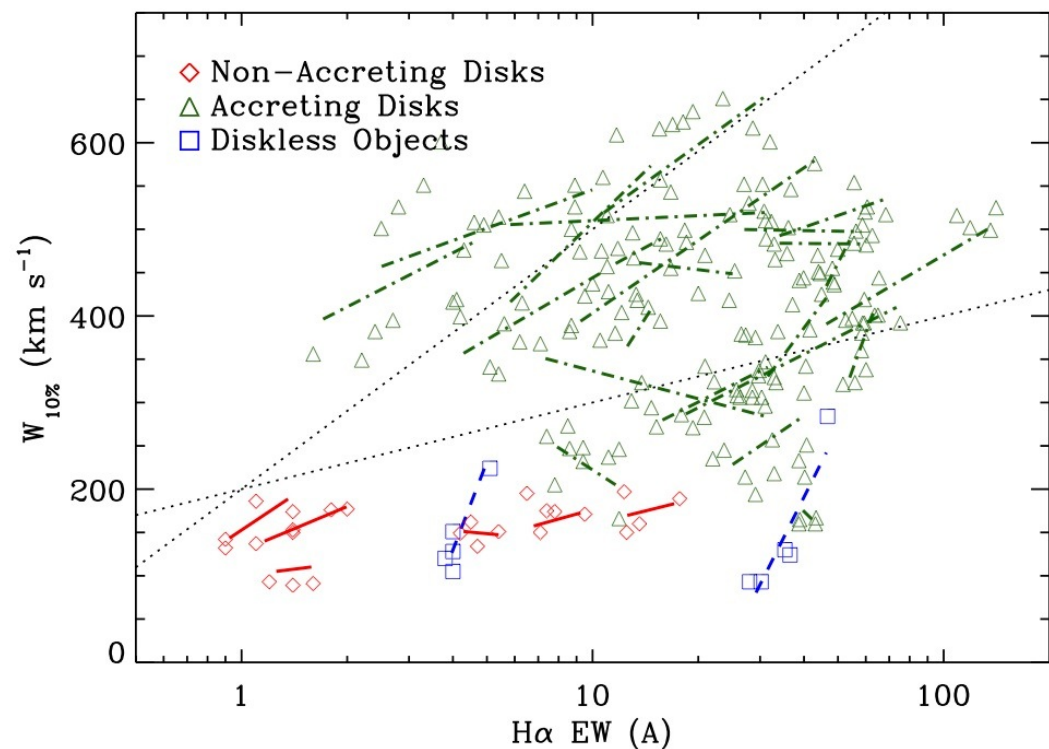
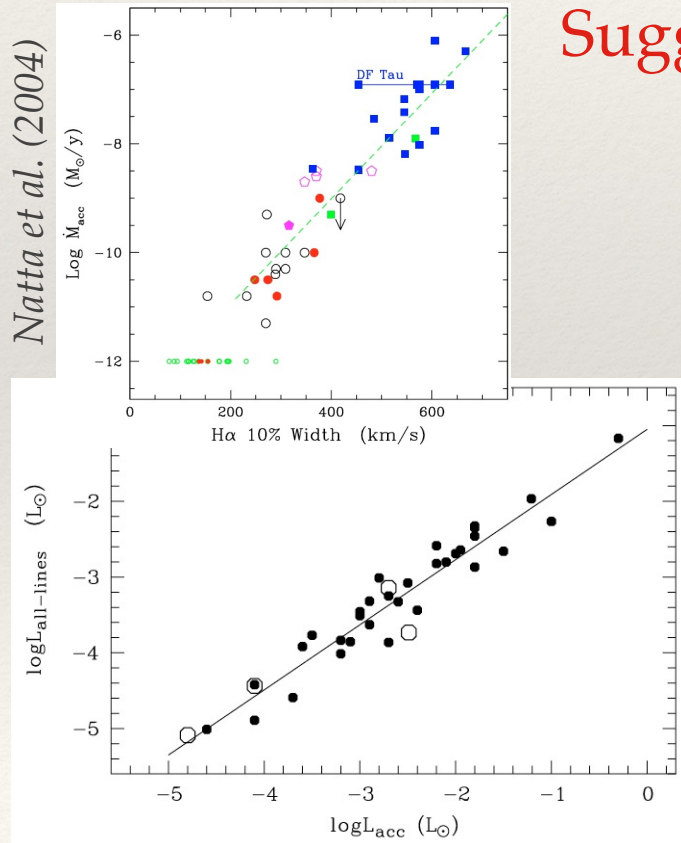
- ❖ Average H α line properties in line with previous obs.
- ❖ Suggests a constant *mean* accretion rate over several yr



Time variability: Short timescales

- ❖ Excursions for most accreting objects follow a similar relationship as ensemble correlations predict

Suggests that $W_{10\%} \propto \dot{M}_{\text{acc}}$ is physically driven



Conclusions

- ❖ Our 13-month monitoring spectroscopic survey of accreting and non-accreting T Tauri stars reveal:
 - no continuous passive disk
 - no object with flickering accretion
 - steady behavior of accretors over several yr
 - some physical grounding for $W_{10\%} \propto \dot{M}_{\text{acc}}$
 - the ambiguity of $W_{10\%}$ accretion threshold

