

Hubble FUV monitoring of TW Hya

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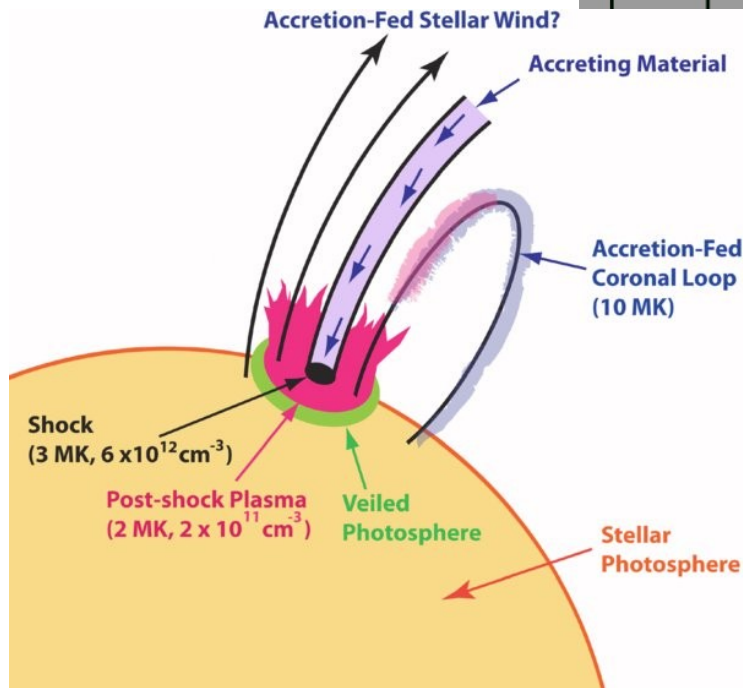
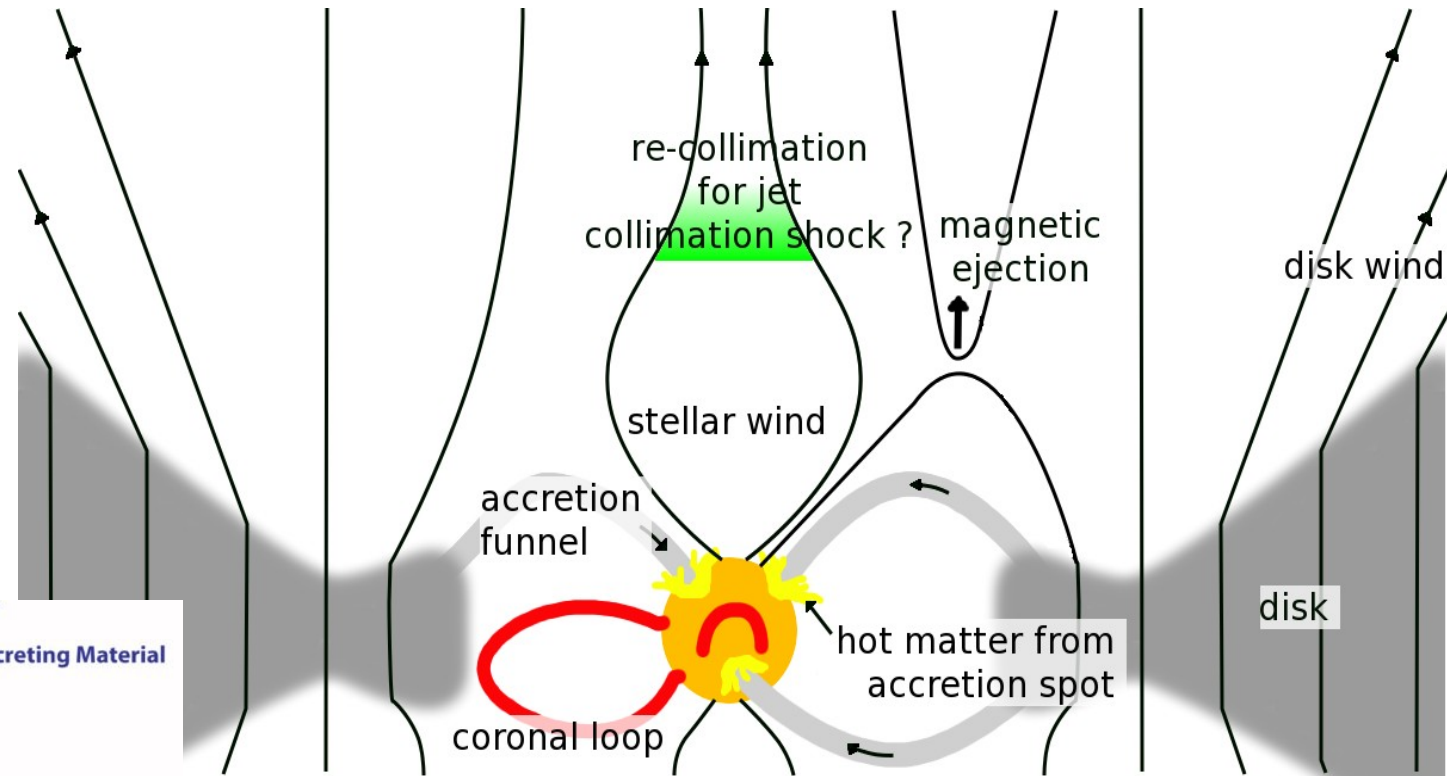


Nancy S. Brickhouse; Andrea K. Dupree; Gerardo Luna;
Peter C. Schneider; Scott J. Wolk

Hot gas around T Tauri stars

Günther (2013)

Brickhouse et al. (2010, 2012)

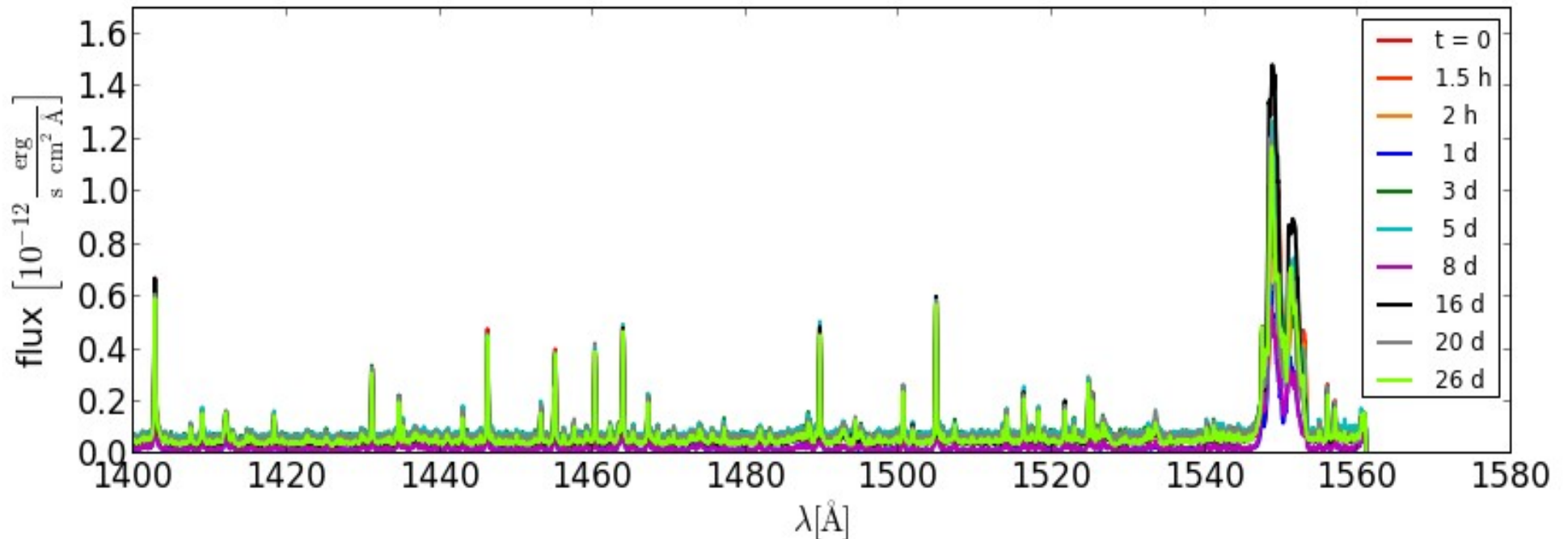


Hot wind?

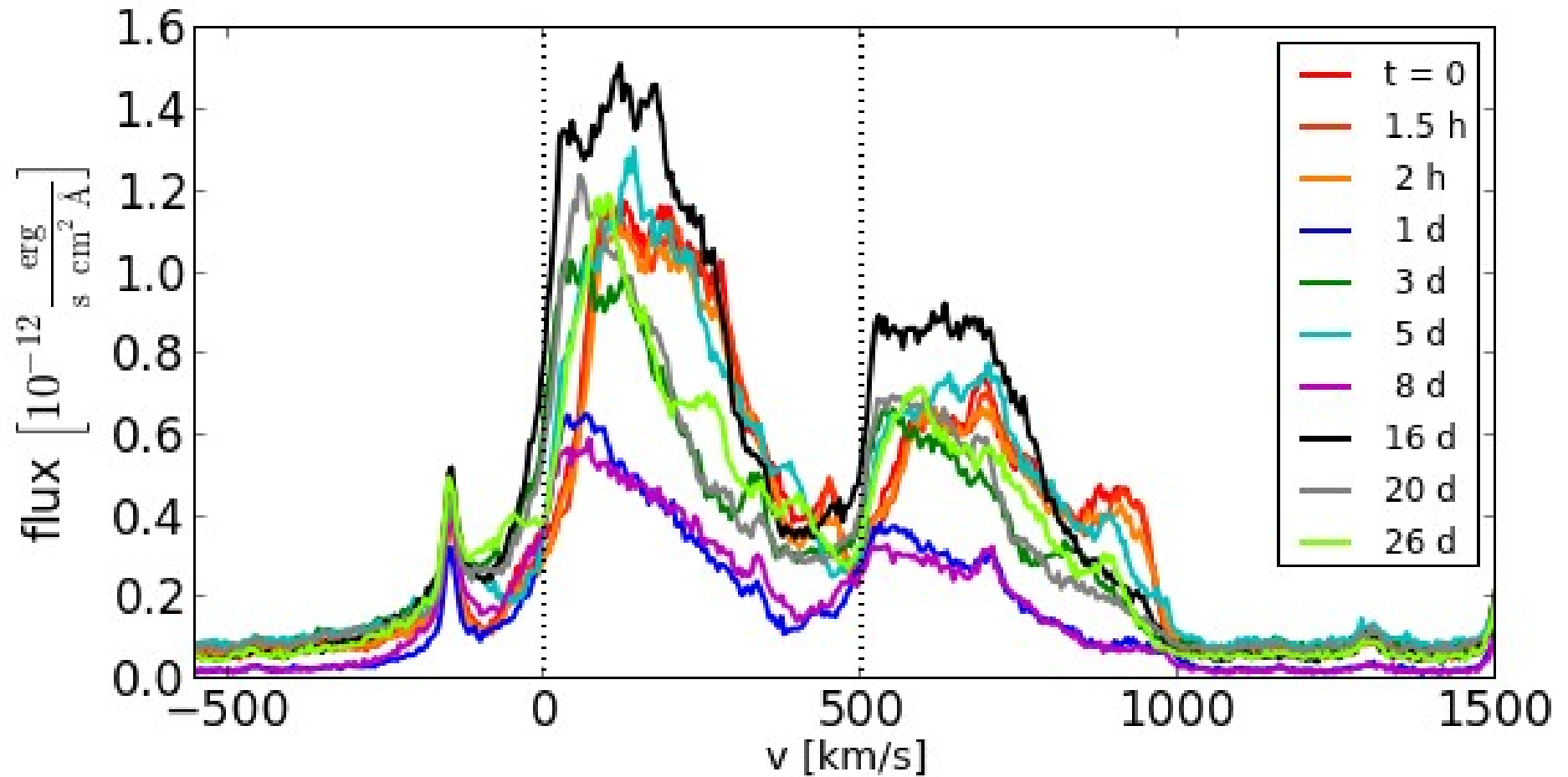
Dupree et al (2005) vs Johns-Krull & Herczeg (2007)

HST/COS data

- 10 orbits HST/COS, spread over one month
- Major components:
 - C IV: accretion shock
 - Continuum: shock-heated photosphere
 - H₂: excited disk (Herczeg et al. 2002, 2004)

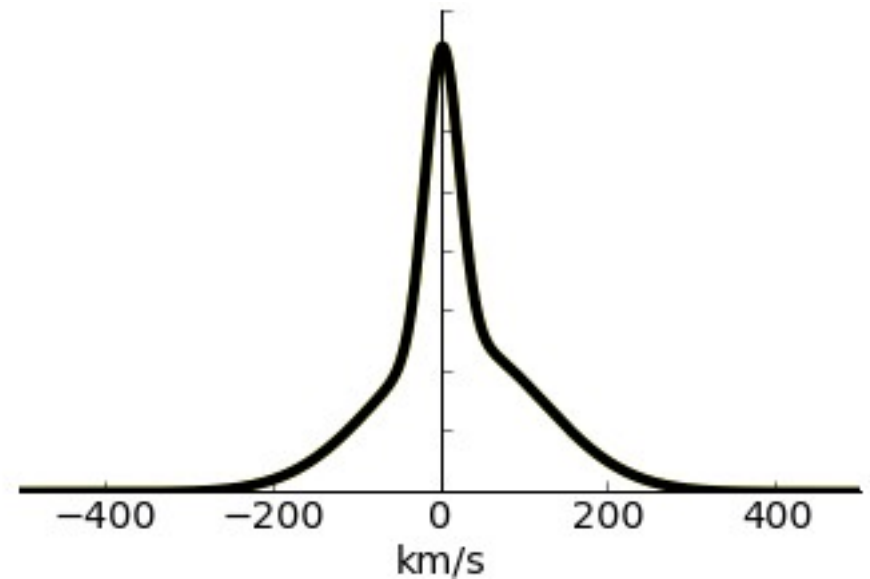
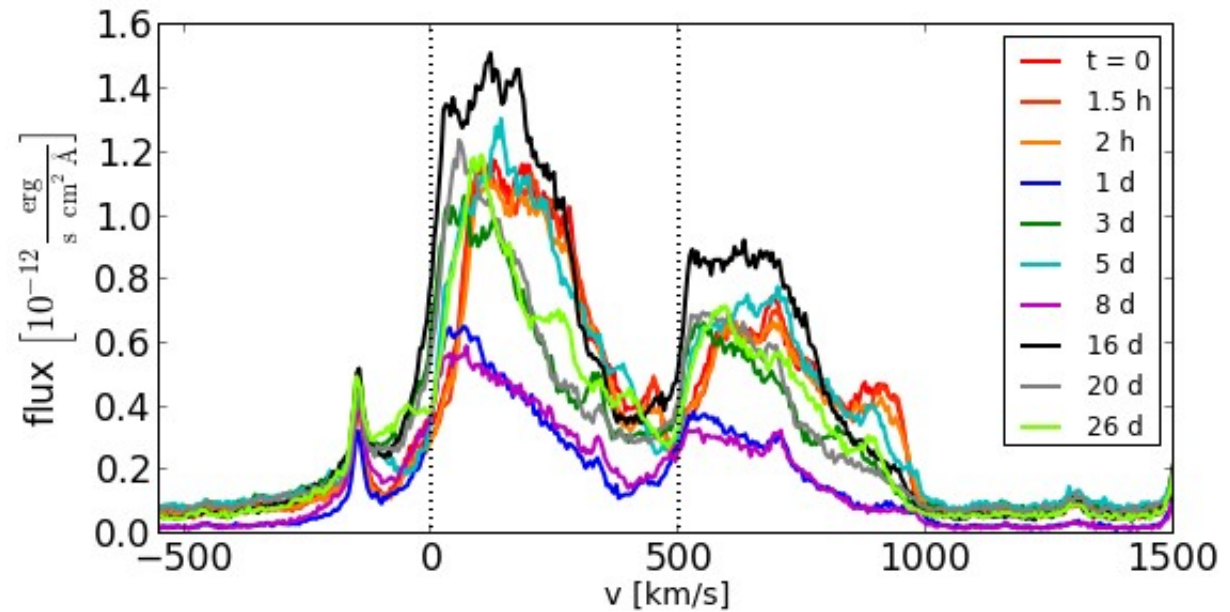


C IV emission lines



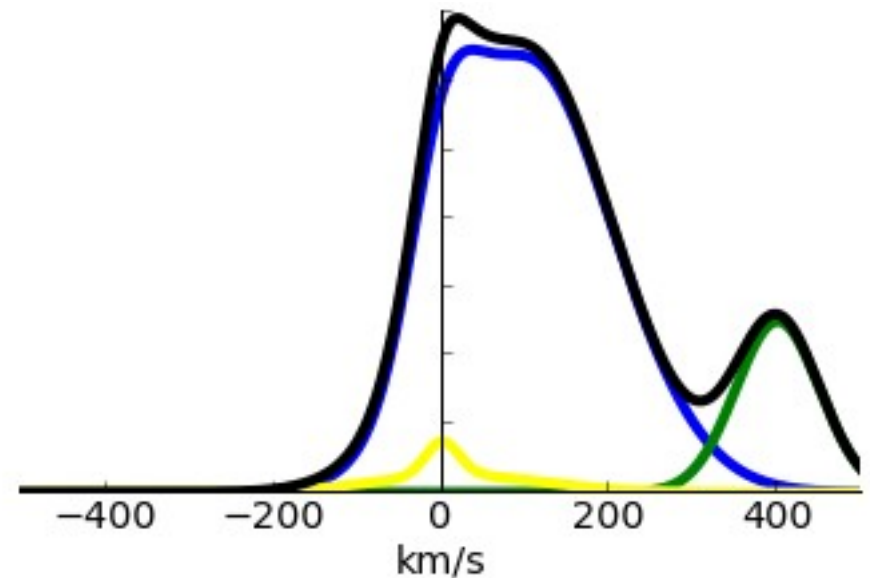
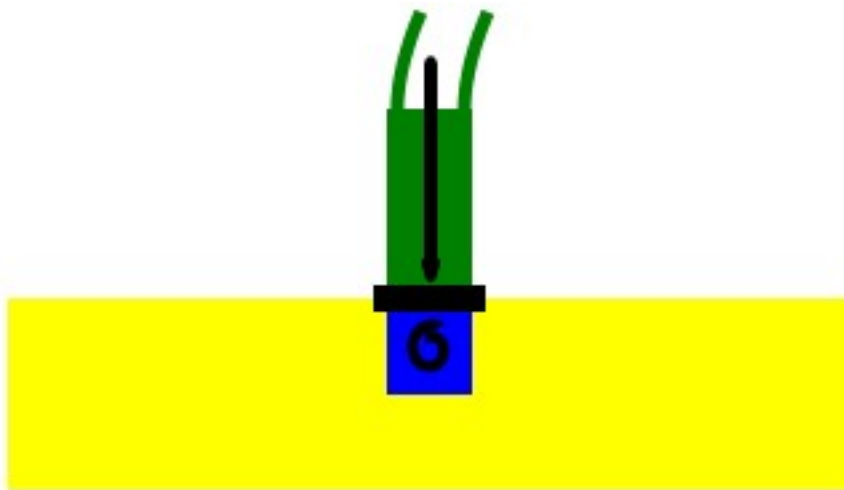
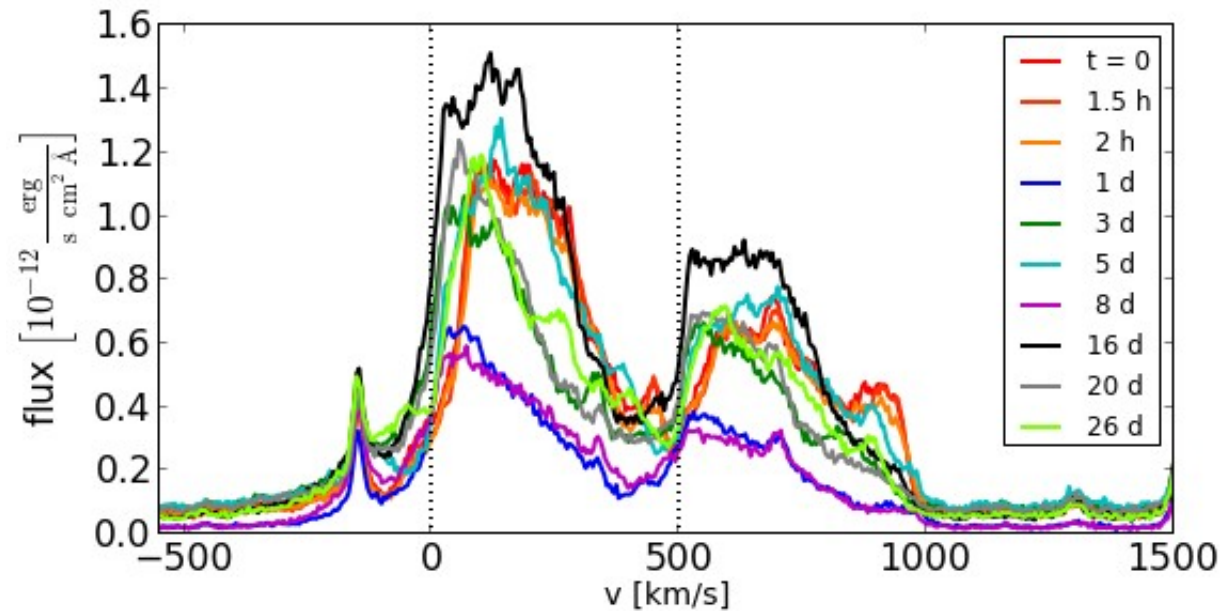
How can we explain the C IV (and other hot ion line) shapes?

- Non-accreting TTS have two component C IV lines (Ardila et al. 2013)



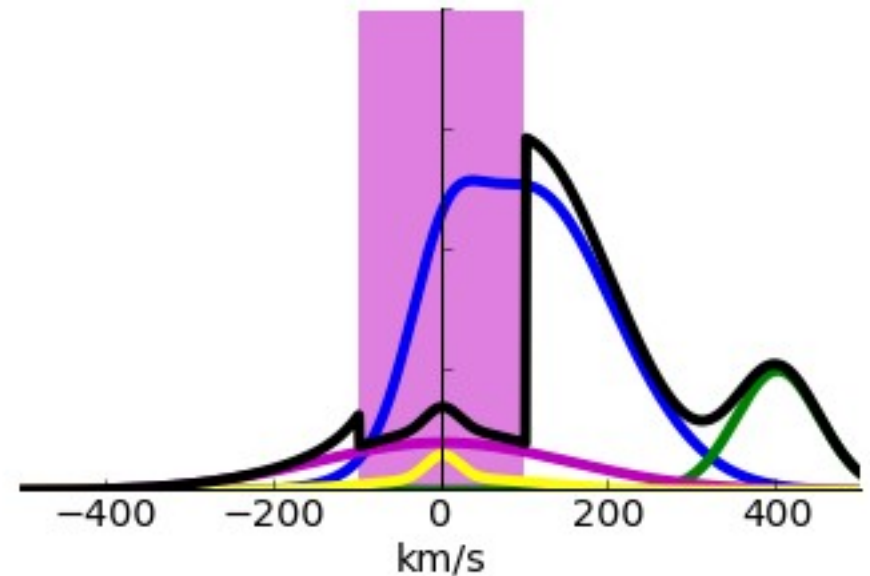
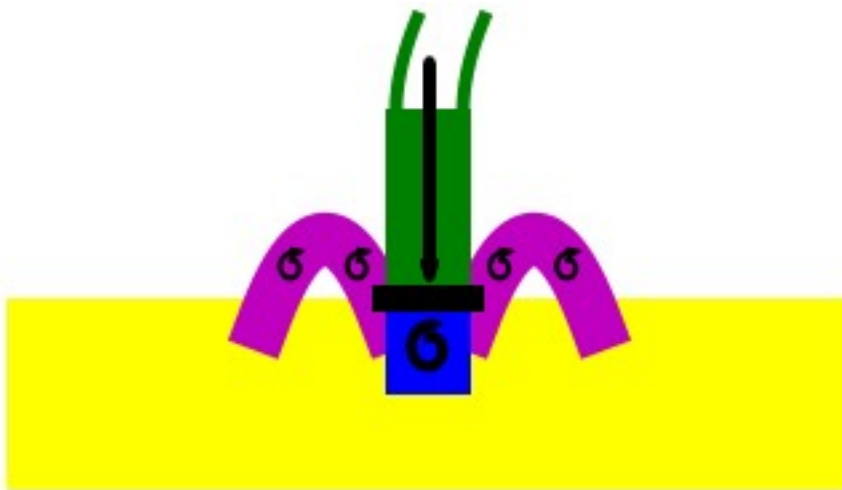
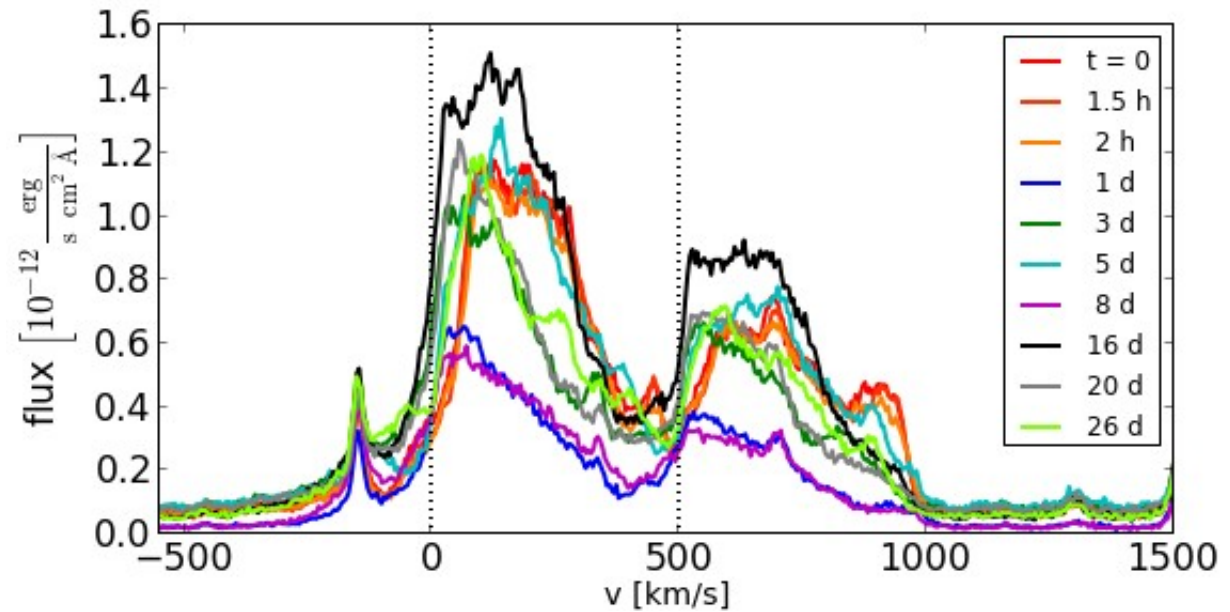
How can we explain the C IV (and other hot ion line) shapes?

- Pre-shock: freefall velocity
- Post-shock: turbulence, $< 1/4$ freefall velocity



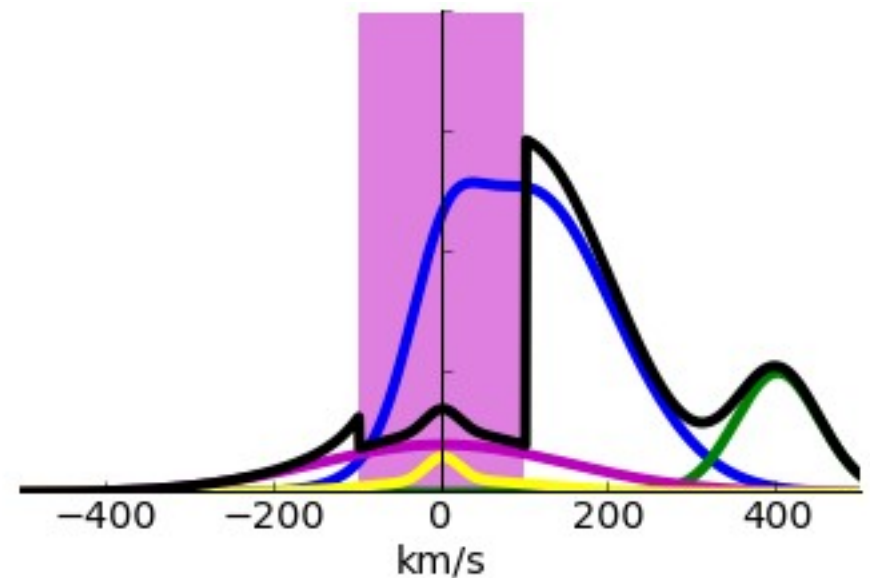
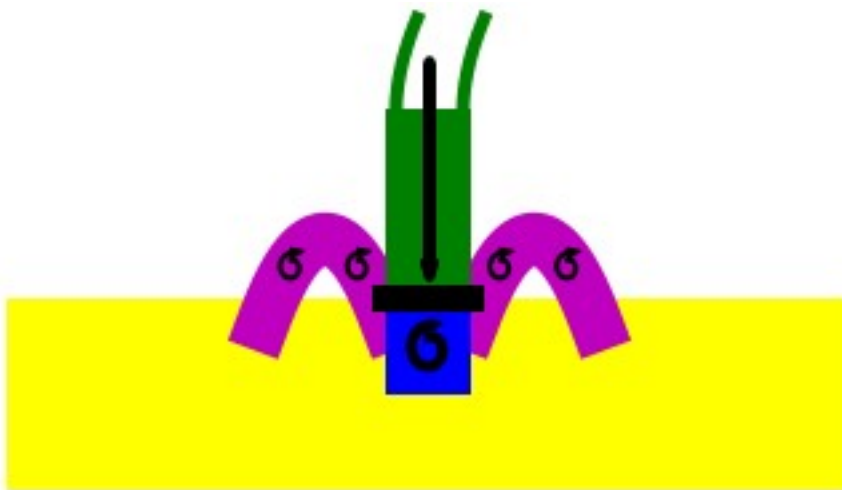
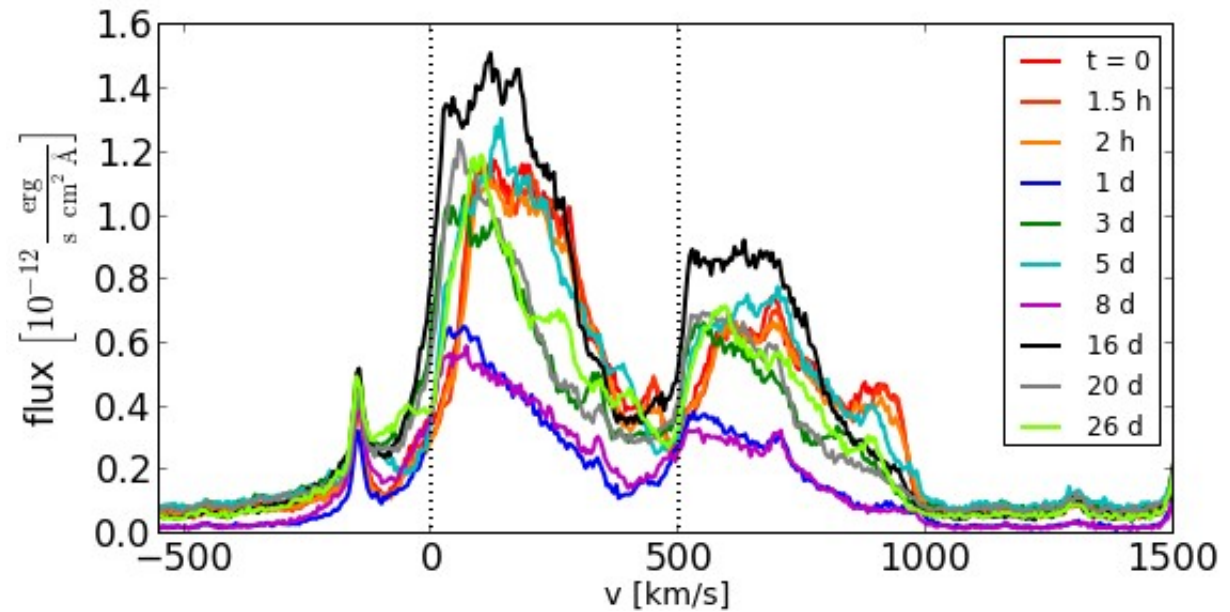
How can we explain the C IV (and other hot ion line) shapes?

- Splatter: turbulent, variable bulk < 100 km/s absorption



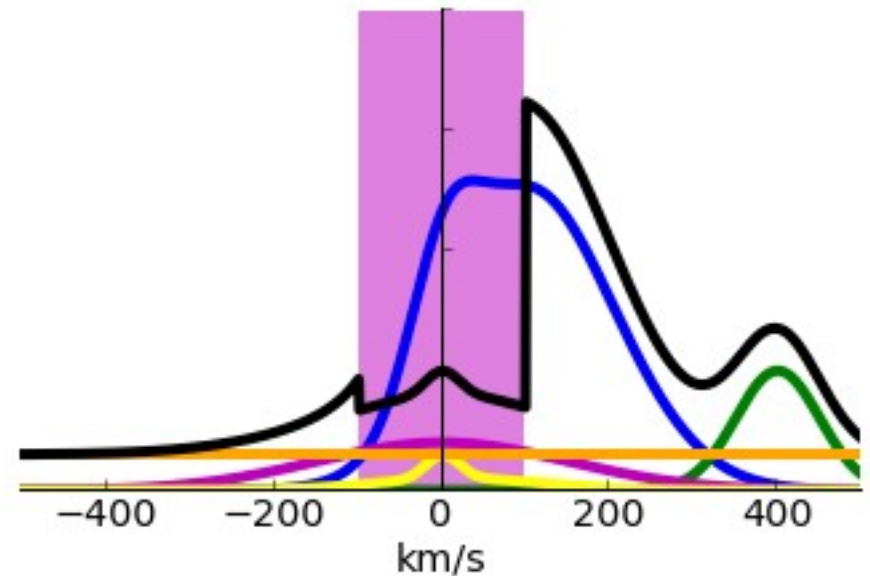
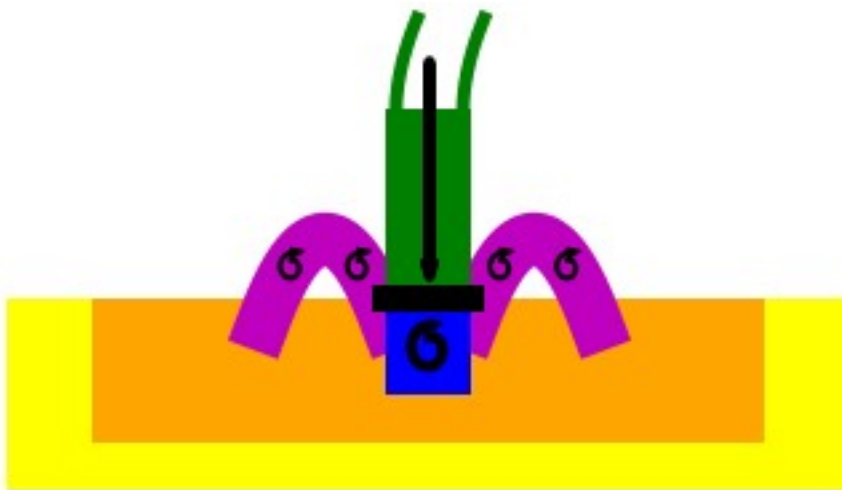
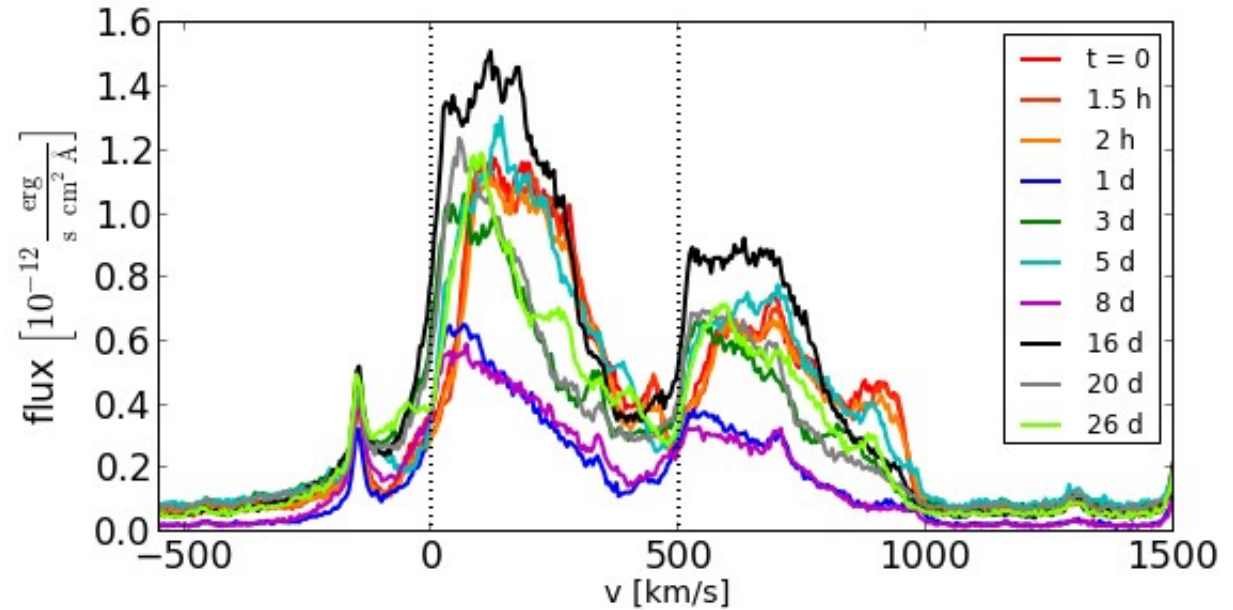
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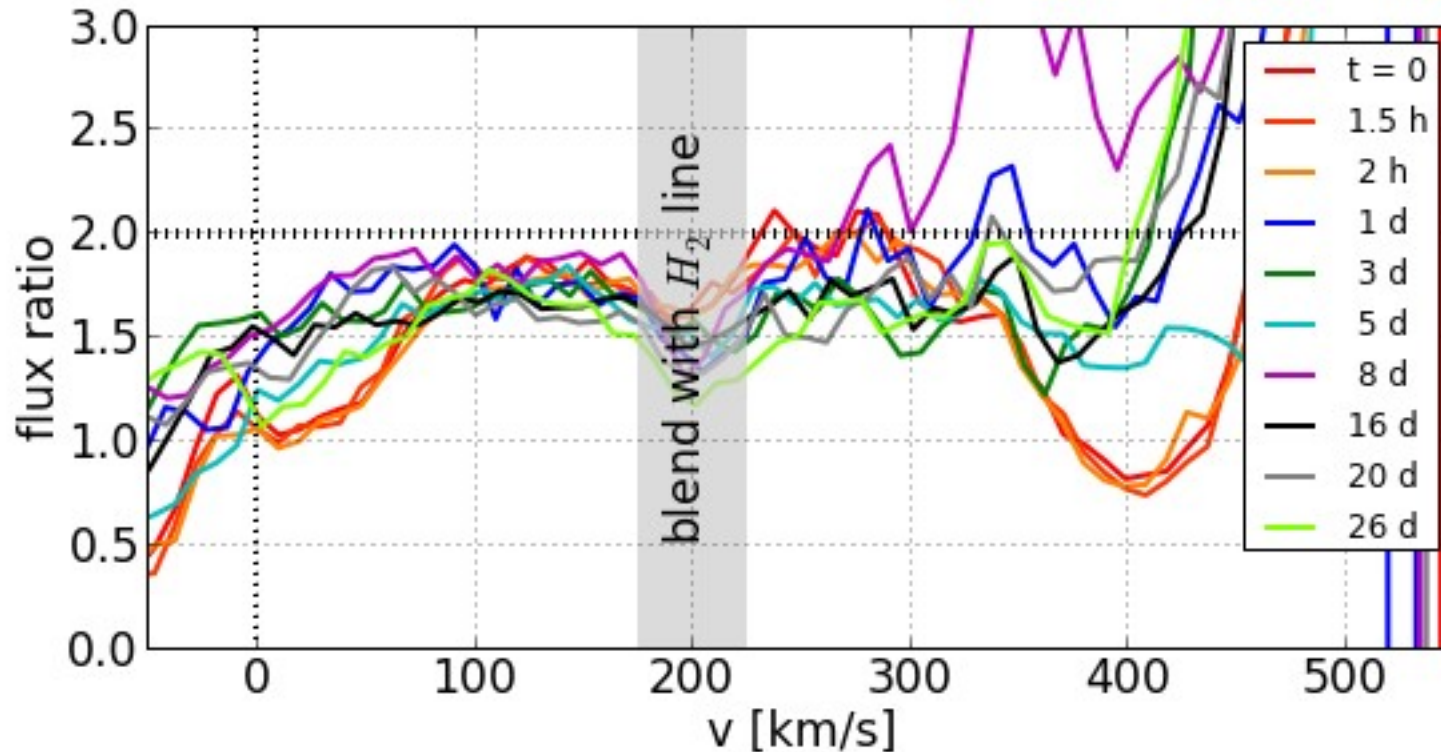
How can we explain the C IV (and other hot ion line) shapes?

- Heated photosphere:
20,000 K
varies with accretion



Optical depth

- C IV is a doublet, with an intrinsic line ratio 2:1
- If the 1448 Ang line is lower, this indicates optical depth in the emission region.



Summary

- FUV continuum varies with FUV emission lines
- FUV H₂ lines are constant
- No hot wind, but a hot splatter (a failed wind)
- C IV lines show some, but not much, optical depth