

Mentoring Committee Meeting

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May 15, 2015



Summary

- Time resolved HST/WFC3 2-band observation of two low mass companions
- Looking for variability and studying the vertical structure of their atmospheres
- A methodology exploration of variability observation in high contrast circumstances

Uniqueness of Low T Atmosphere

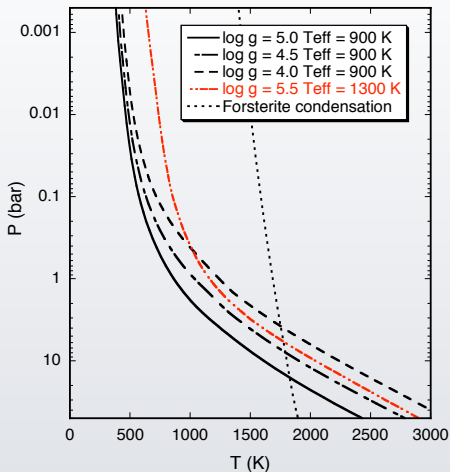
- Complex chemistry and molecules
- Condensation and cloud formation

Condensate species:

MgSi_3 , Mg_2Si_4 , ...

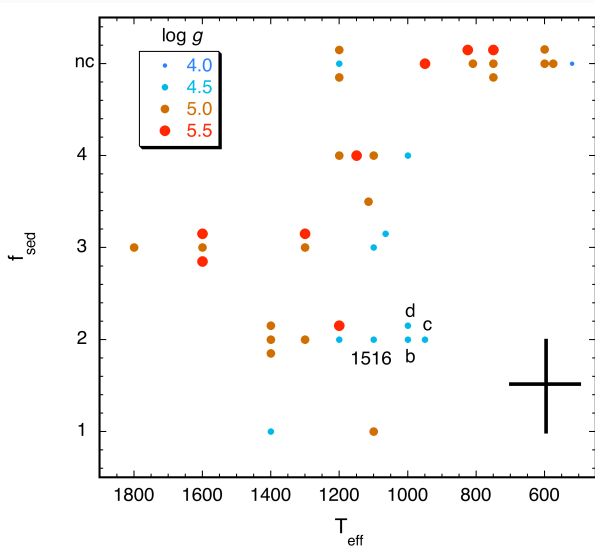
to H_2O , NH_3 ,...

Clouds at low surface gravity



Marley et al. (2012)

Clouds at low surface gravity

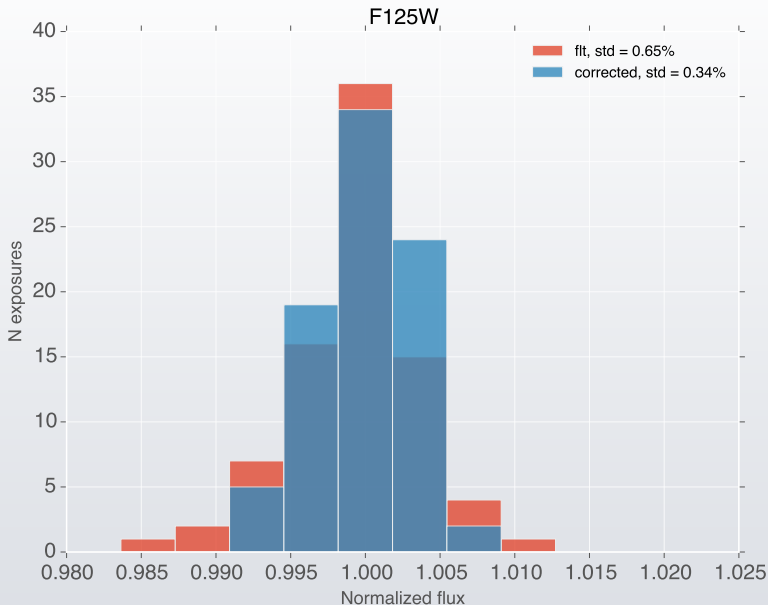


Marley et. al. (2012)

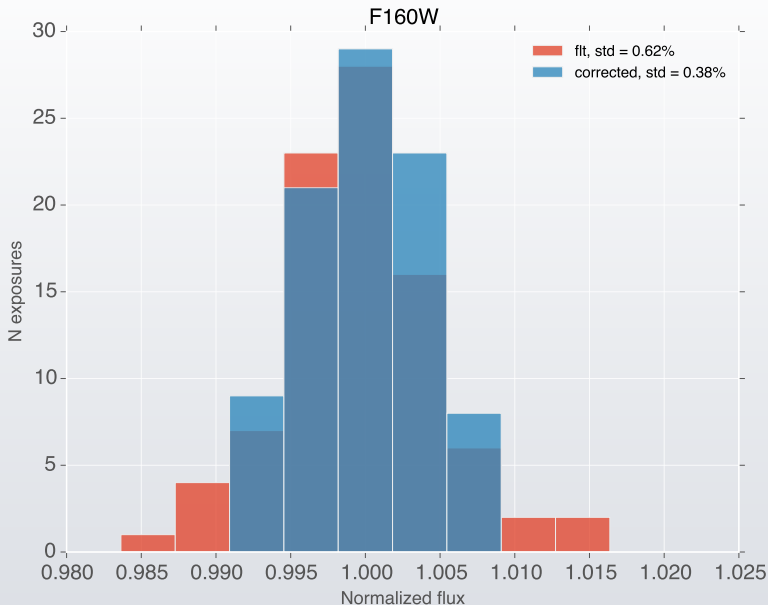
Clouds at low surface gravity

- low gravity ->
higher cloud base, larger particle size, thicker clouds
- thicker clouds ->? more homogeneous cloud coverage

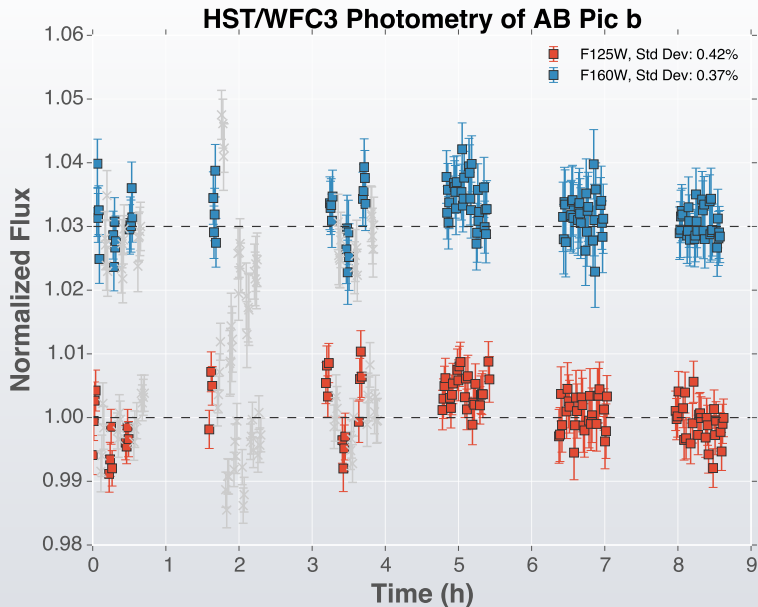
Reducing Scattering



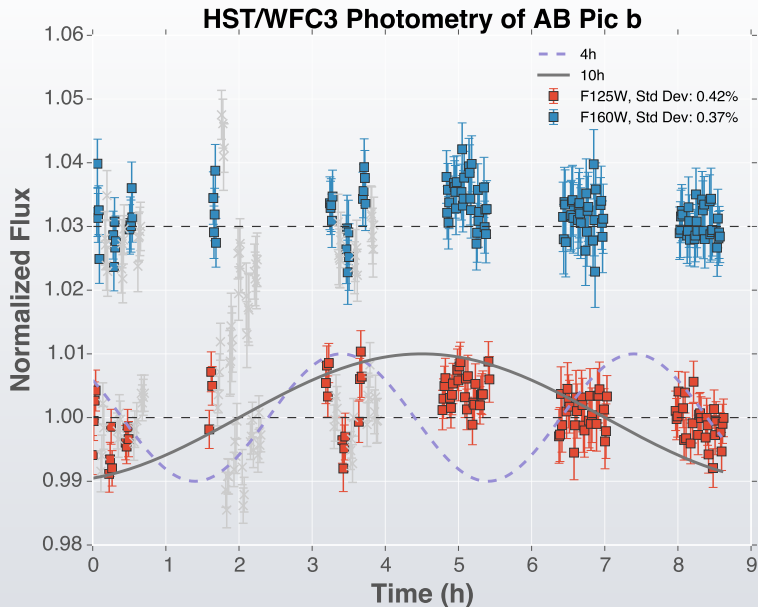
Reducing Scattering



Light Curve



Light Curve



Status with 2M1207 b

- Photometry limited by the residual of primary
- 3% precision (5x photon noise)

Summer plan

- Finish data reduction with 2M1207 b
- Determine a publication strategy
- finish one/two paper draft(s)

Further future plan

HST LOW MASS OBJECTS VARIABILITY SURVEY

- 20 objects, 120 orbits
- A homogeneous survey that contains low surface gravity, high surface gravity objects
- spectroscopy and multi-band photometry

Further future plan

BROWN DWARF ATMOSPHERE STUDY WITH STORM DATA

- statistical analysis of cloud thickness, variability phase shift, etc.

POTENTIAL SIDE PROJECT

- modeling the patchy clouds

Further future plan

GROUND BASED OBSERVATION

- time resolved spectroscopy