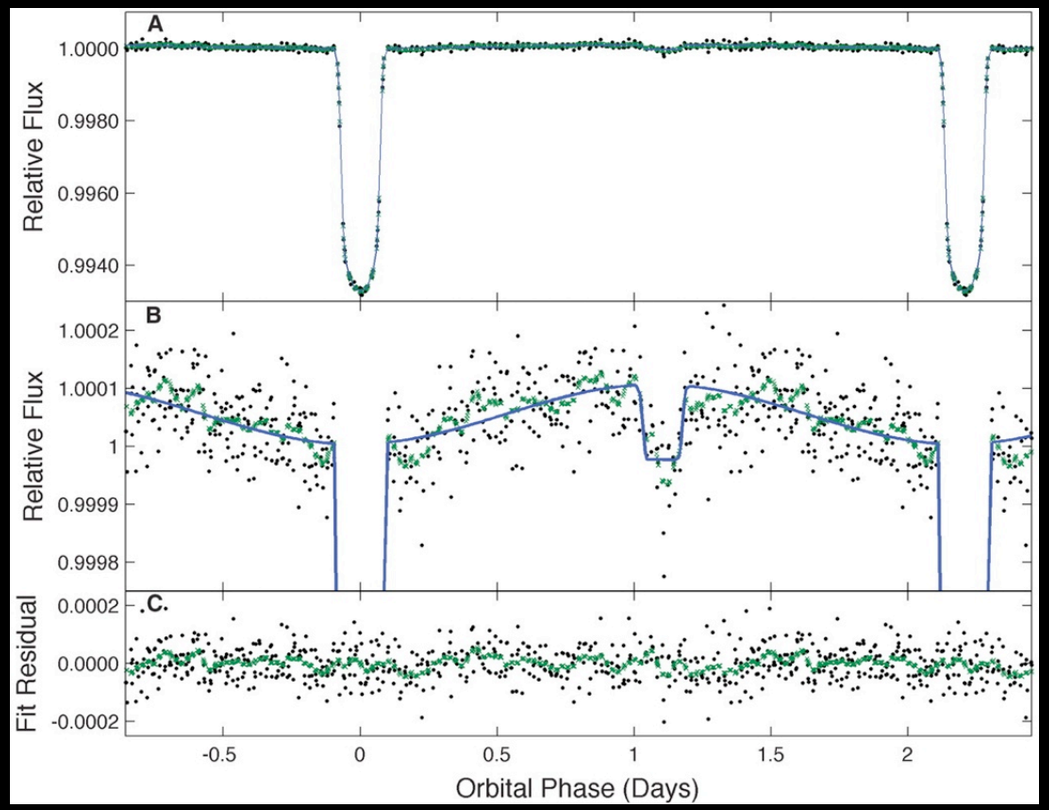
High accuracy & long timescale LC



November 2012 - Munich

Dimitris Mislis & Simon Hodgkin
IoA

Radial Velocity Survey

846 Exoplanets - 55%

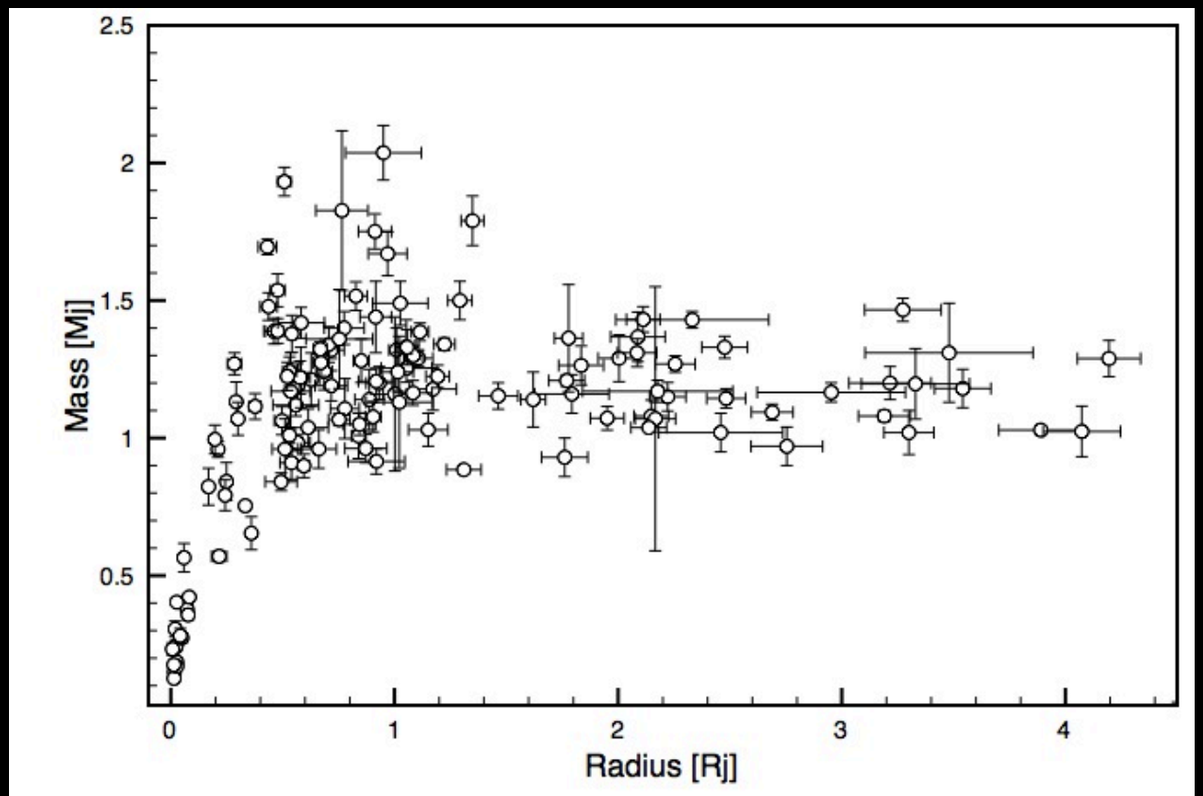
Radial Velocity Survey

846 Exoplanets - 55%

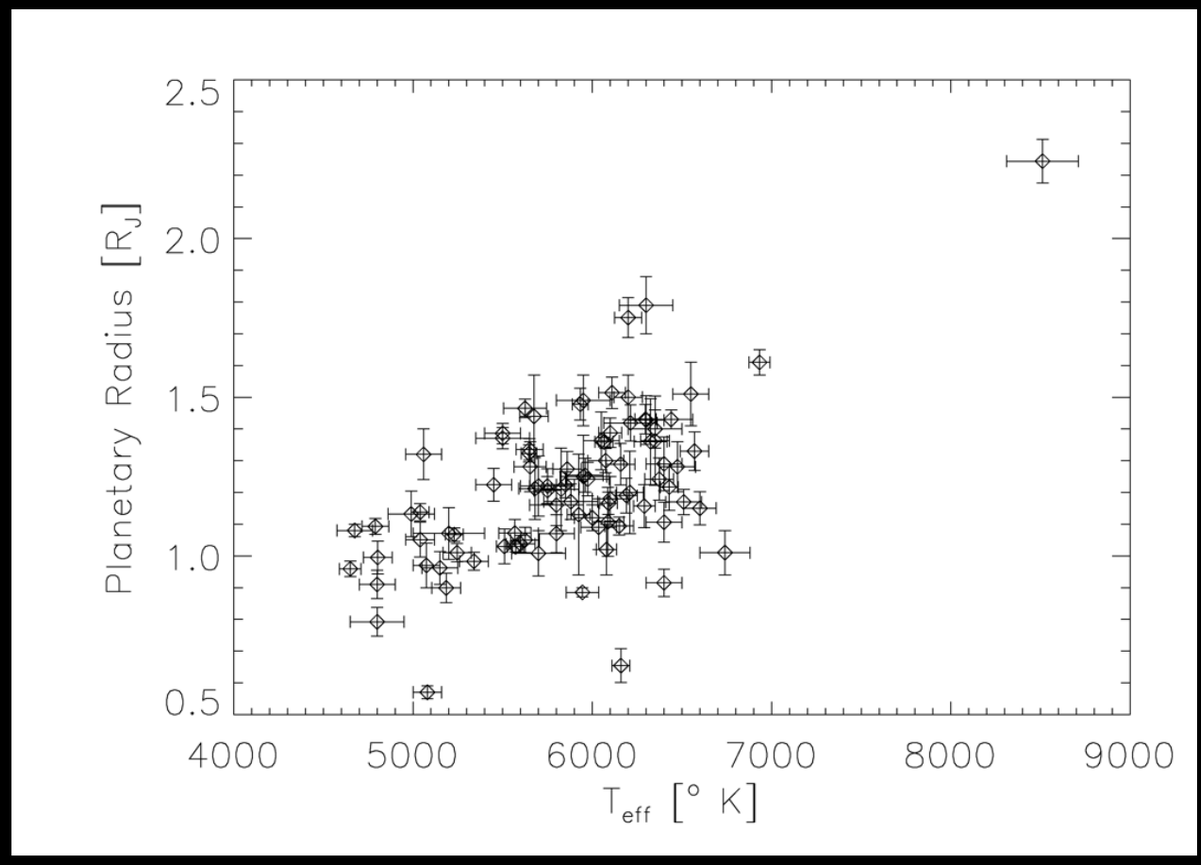
55% Exoplanets - No radius information

Mass vs Radius diagram ?
Transmission spectroscopy ?
Temperature & secondary eclipse ?

Transits



Mass - Radius diagram



Radius - Temperature diagram

Space missions
Kepler

3.5 years in orbit

Space missions
Kepler

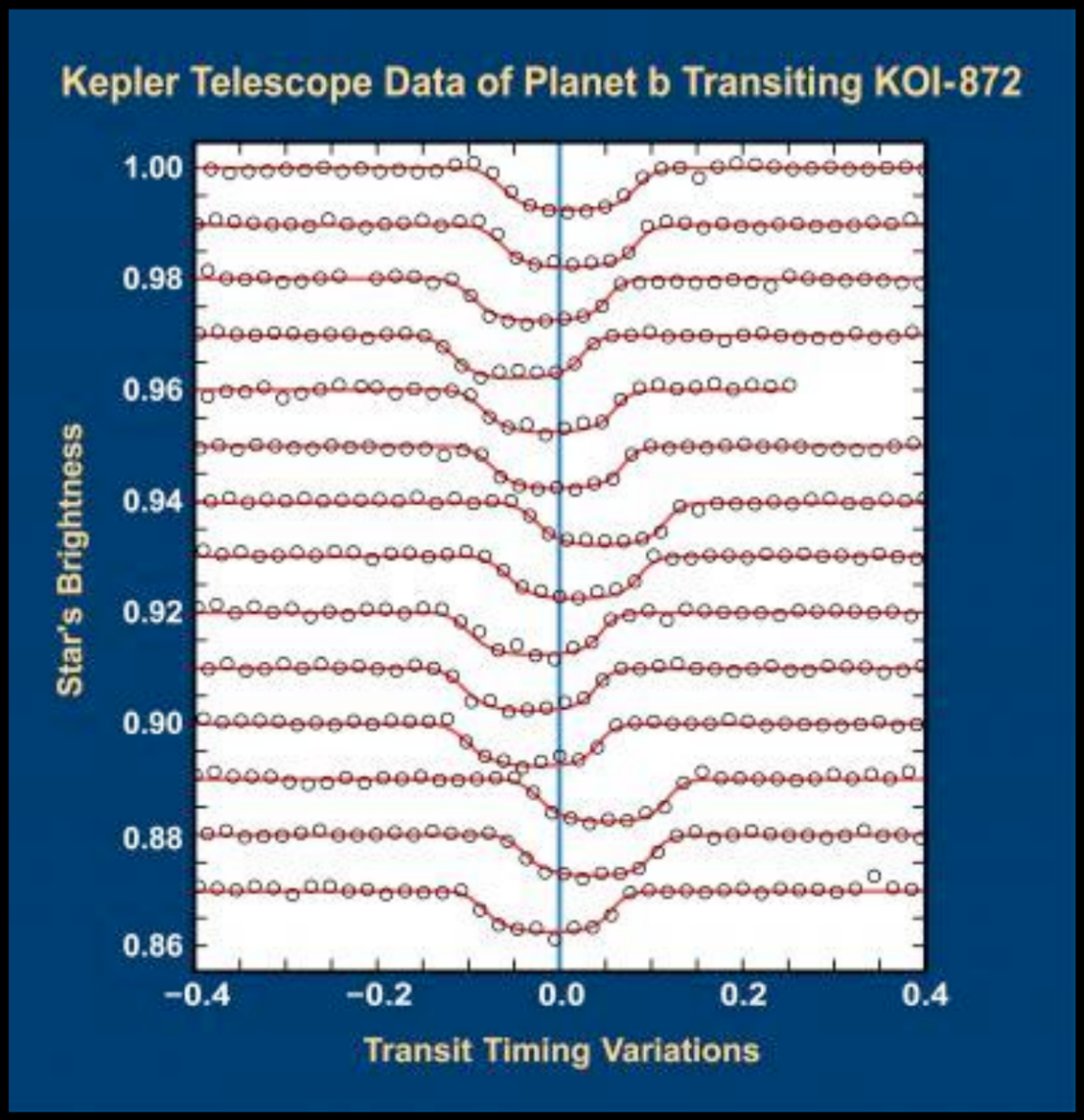
3.5 years in orbit

Data
a) Good
b) Many

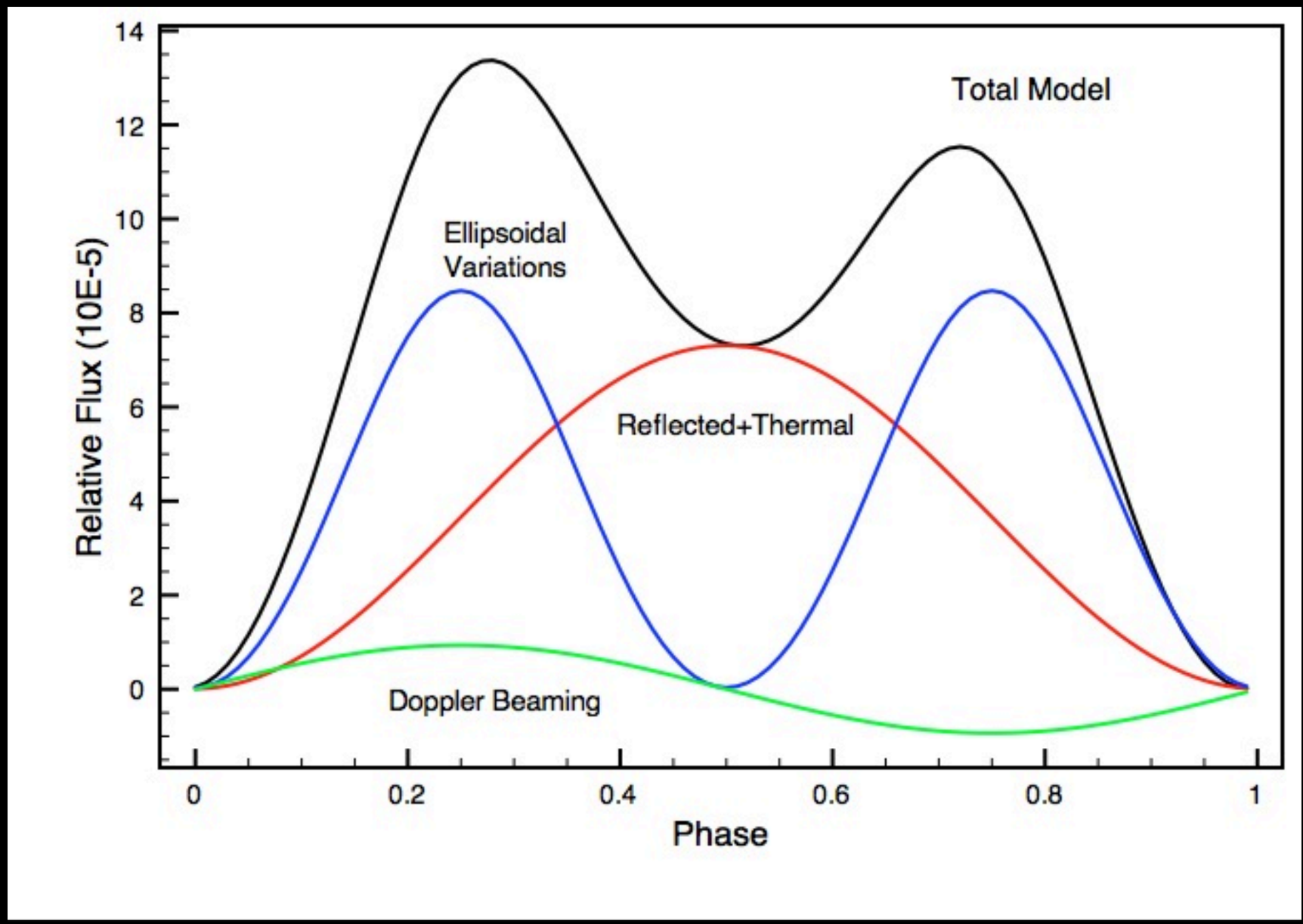
High Accuracy

Extra Info

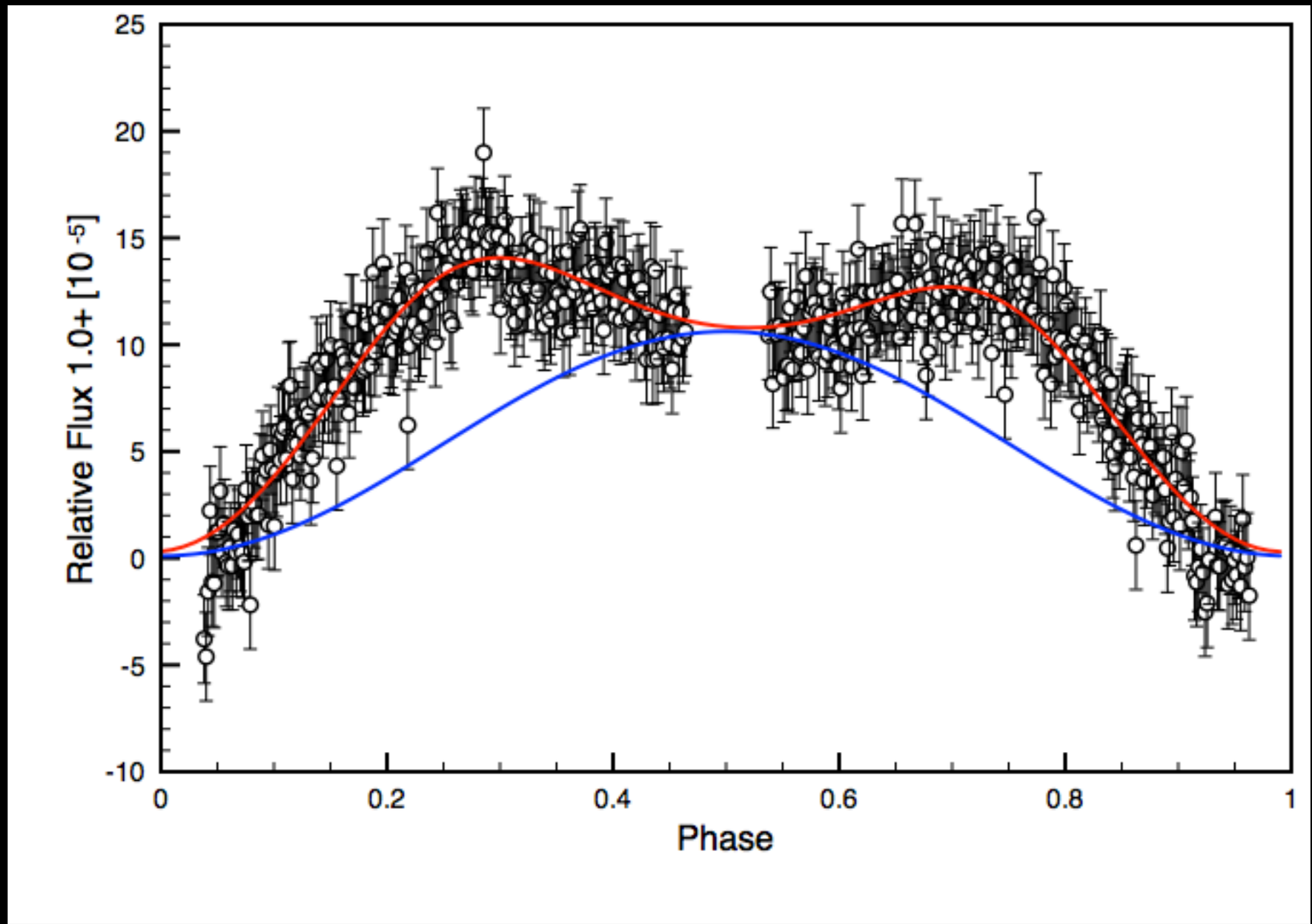
TTVs
DTVs
E.V
Thermal emission
Reflected light
Doppler Beaming
non-transiting



High Accuracy

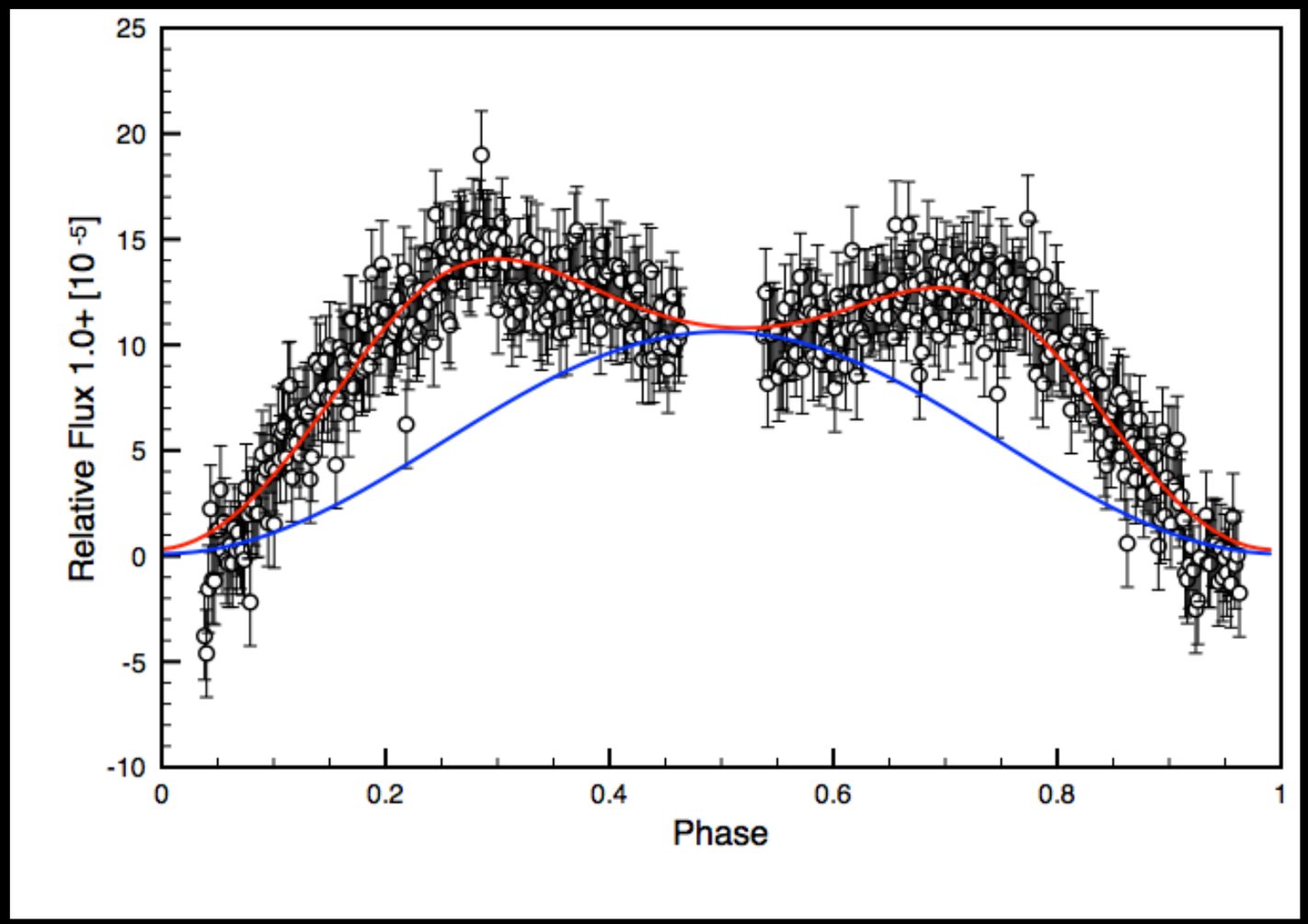


KOI - 13b



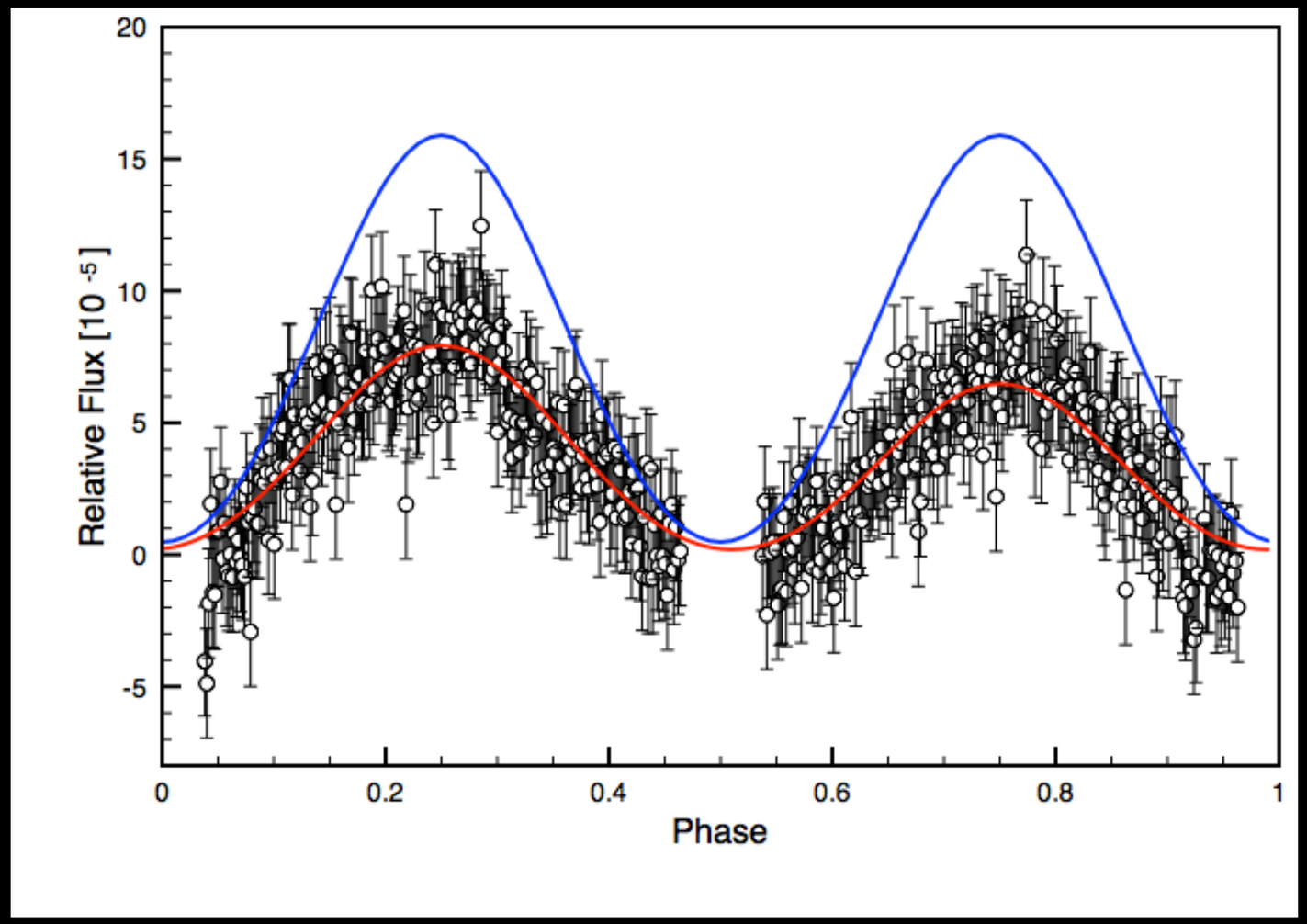
Mislis & Hodgkin MNRAS 2012

KOI - 13b



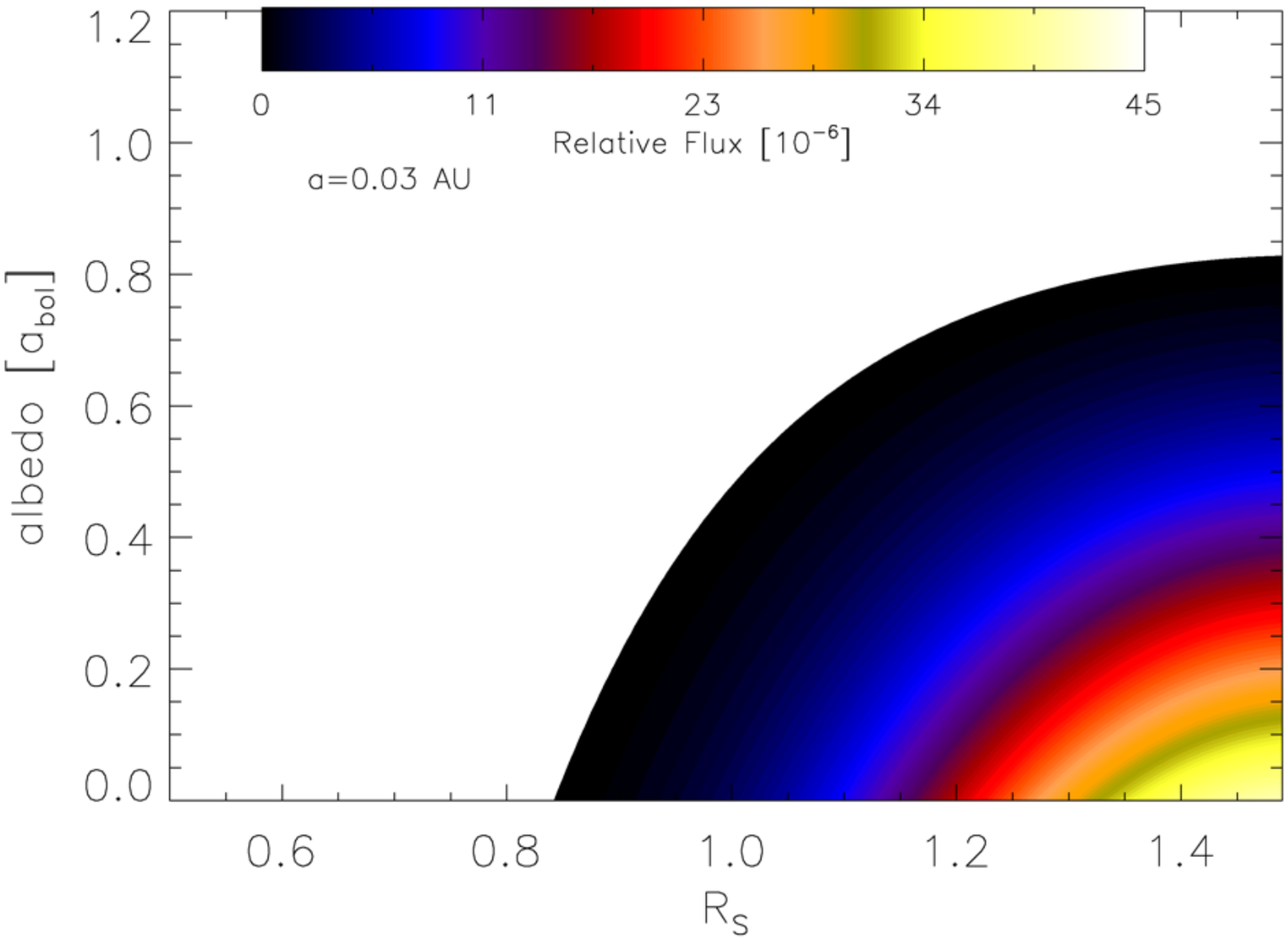
Mp ~ 8.5 Mj
Rp = 1.7Rj
Tp ~ 3500 K
ag ~ 0.2-0.3
e = 0.0

KOI - 13b



Mp ~ 8.5 Mj
Rp = 1.7Rj
Tp ~ 3500 K
ag ~ 0.2-0.3
e = 0.0

Thermal Emission



Rp = 1.0 RJ
a = 0.03 AU

$\lambda = 550nm$

Remember !!

846 Exoplanets - 55%

55% Exoplanets - No radius information

Remember !!

846 Exoplanets - 55%

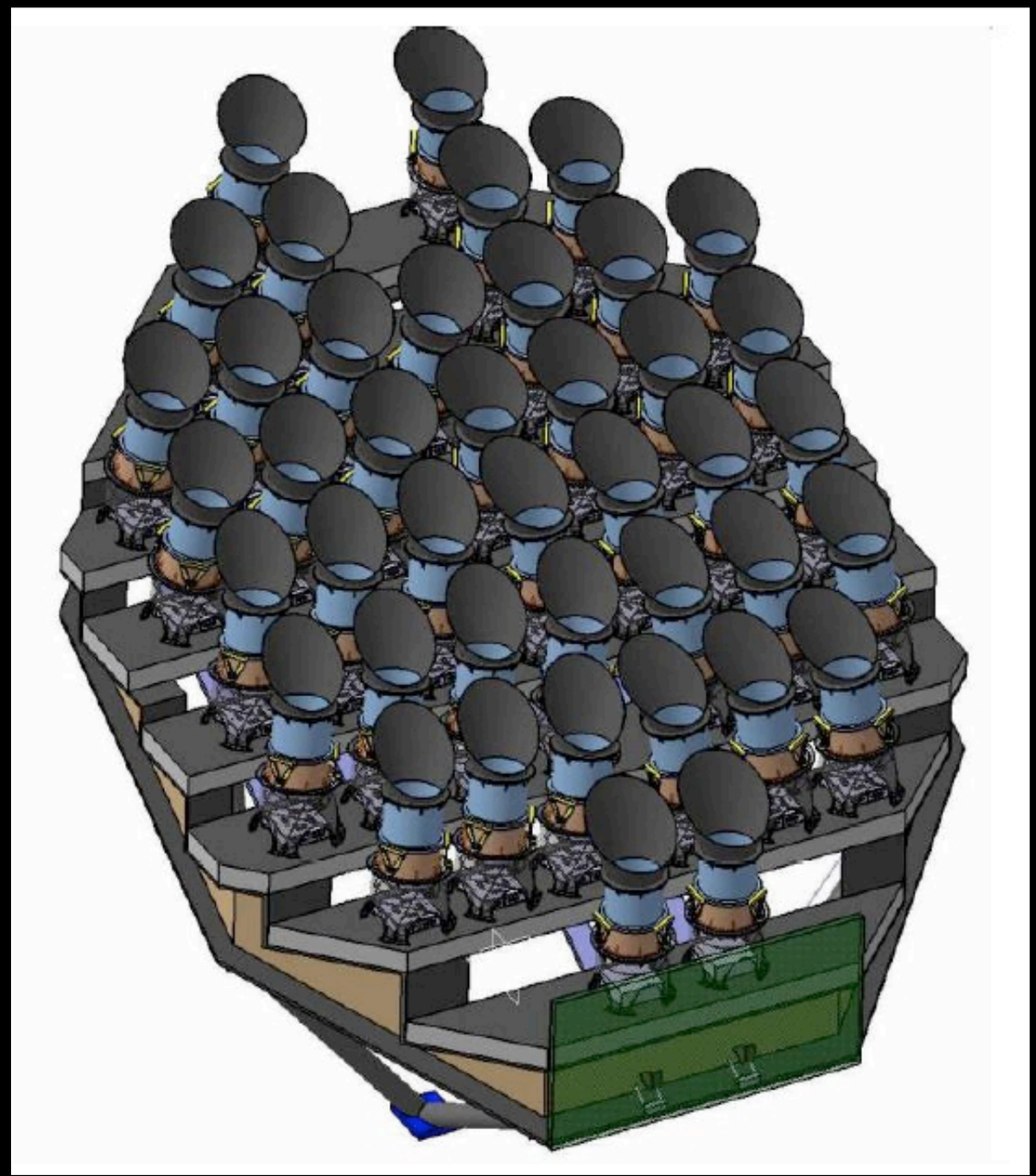
55% Exoplanets - No radius information

Reflected + Thermal emission → Planetary Radius RV or non-transiting

Plato Mission

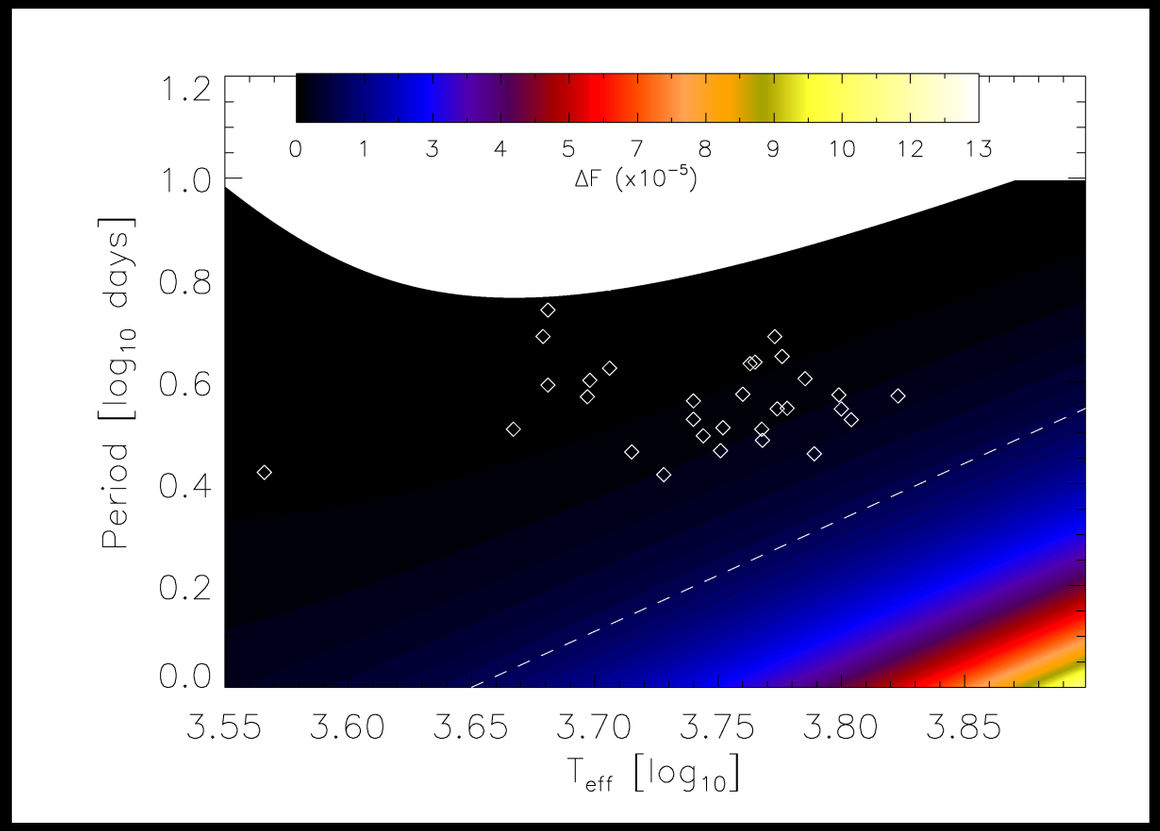
~ 18,000 - 50,000 Exoplanets
Follow up ?

PLATO Red Book

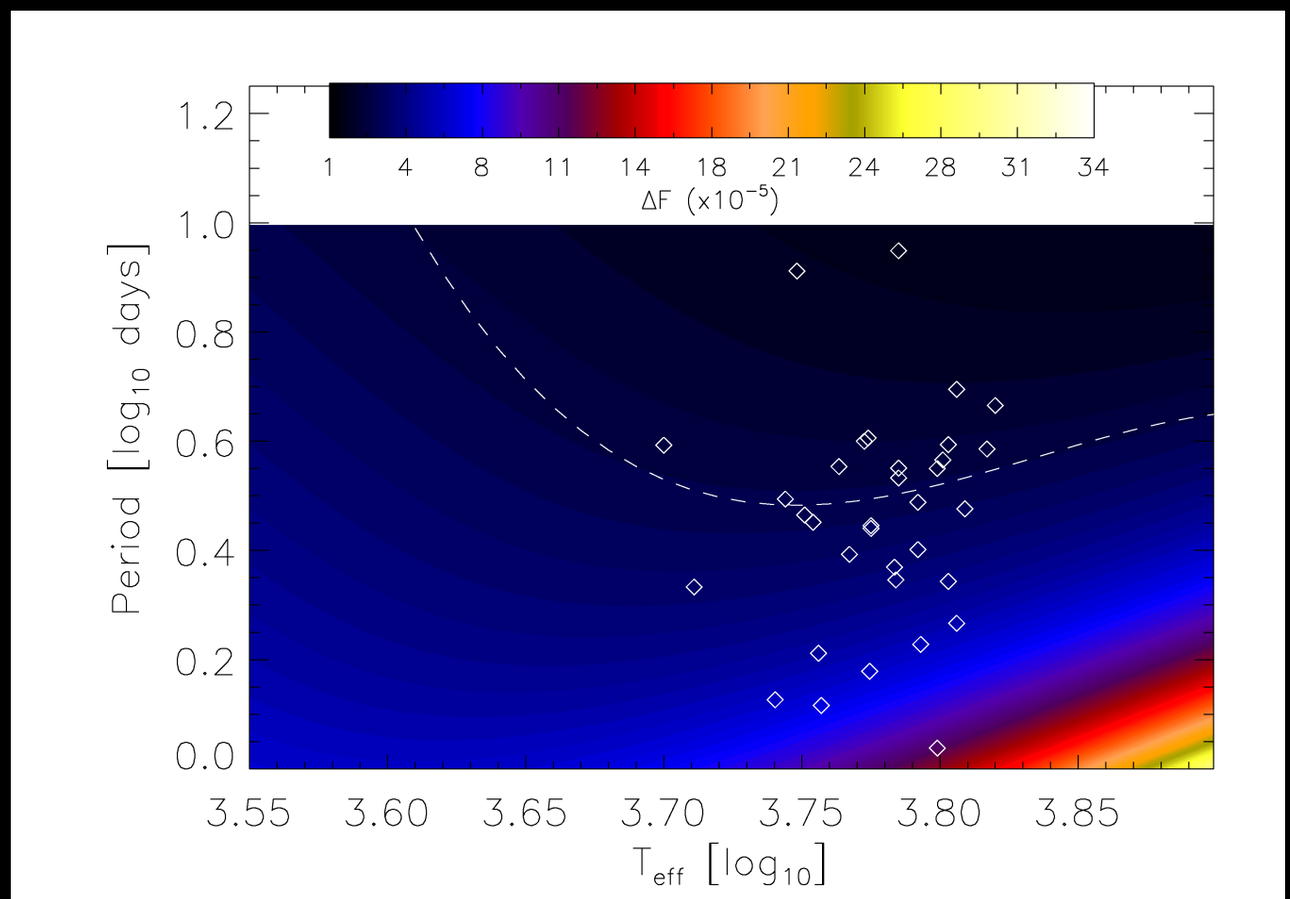


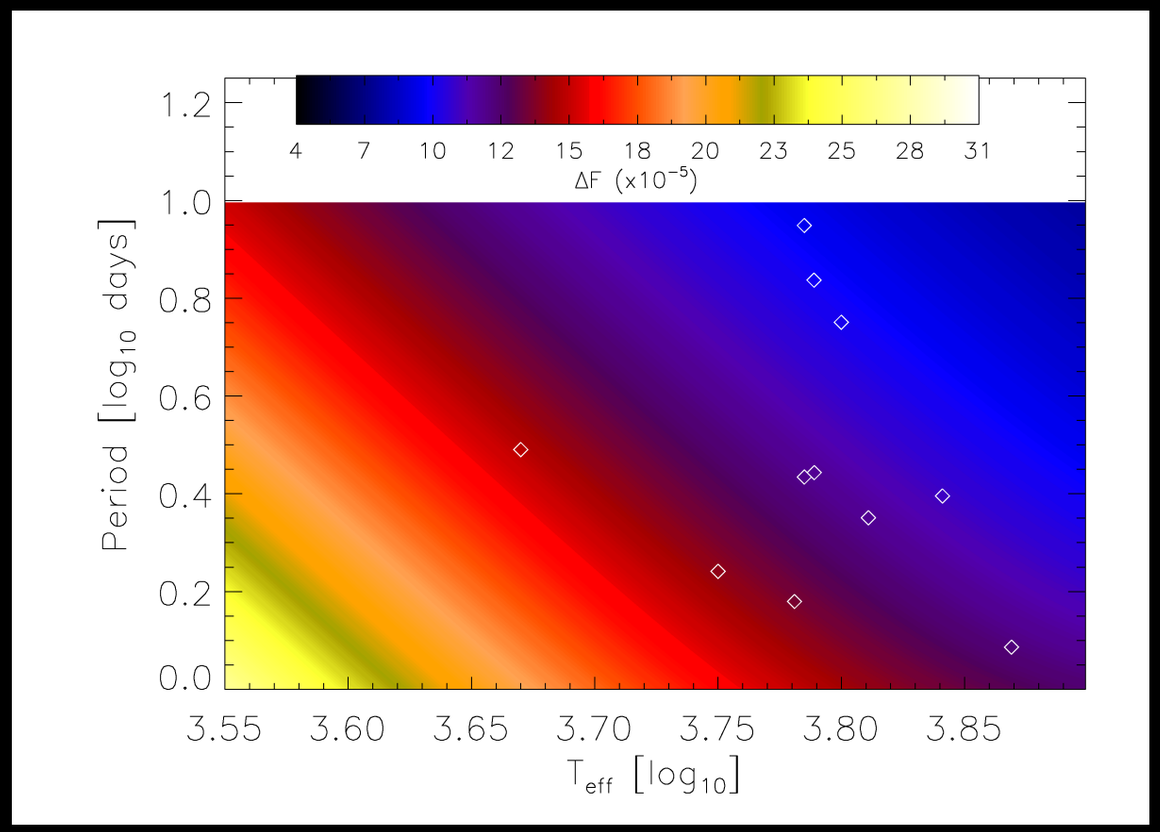
PLATO Mission

0.5 Mj



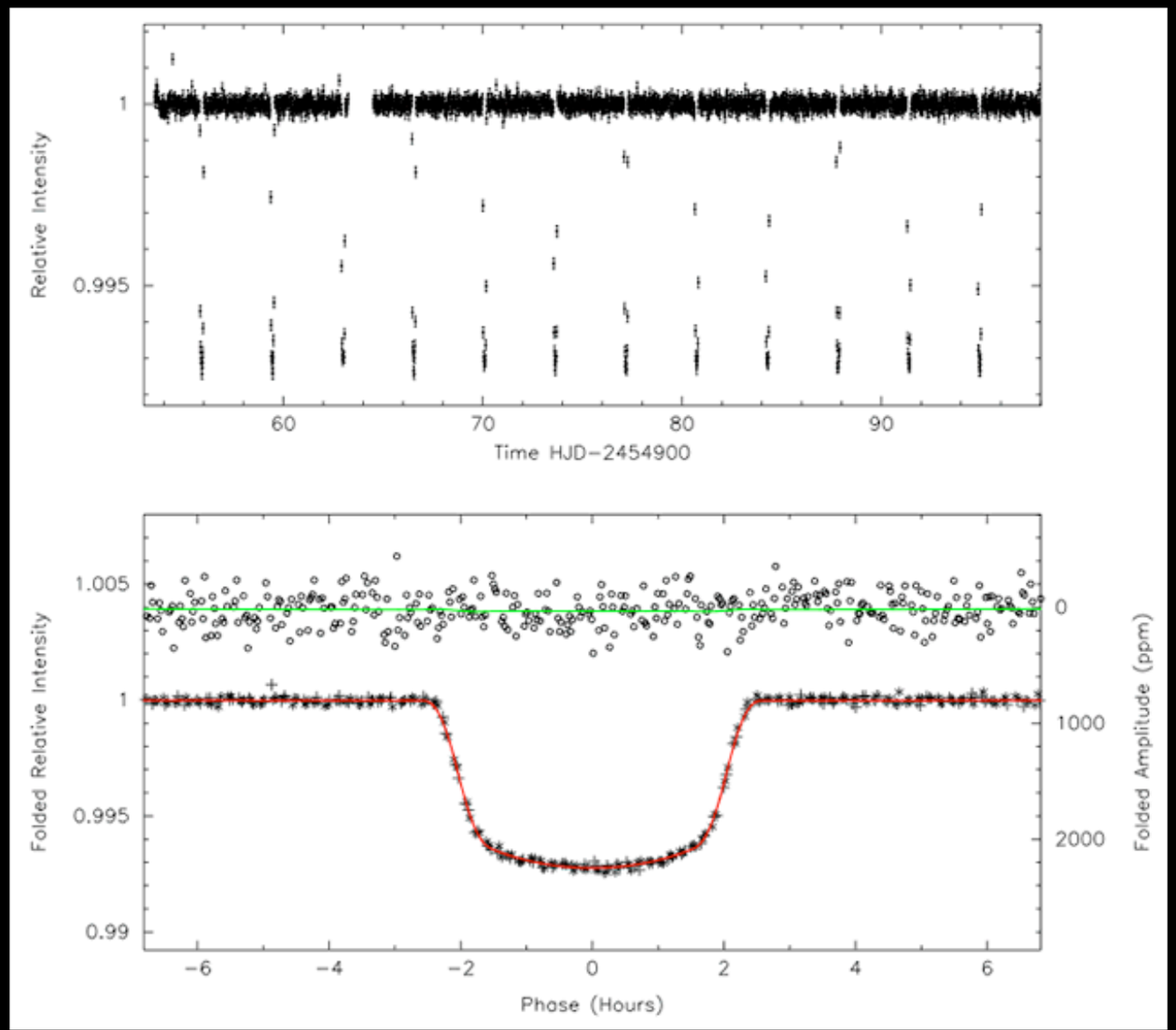
1 Mj





5 Mj

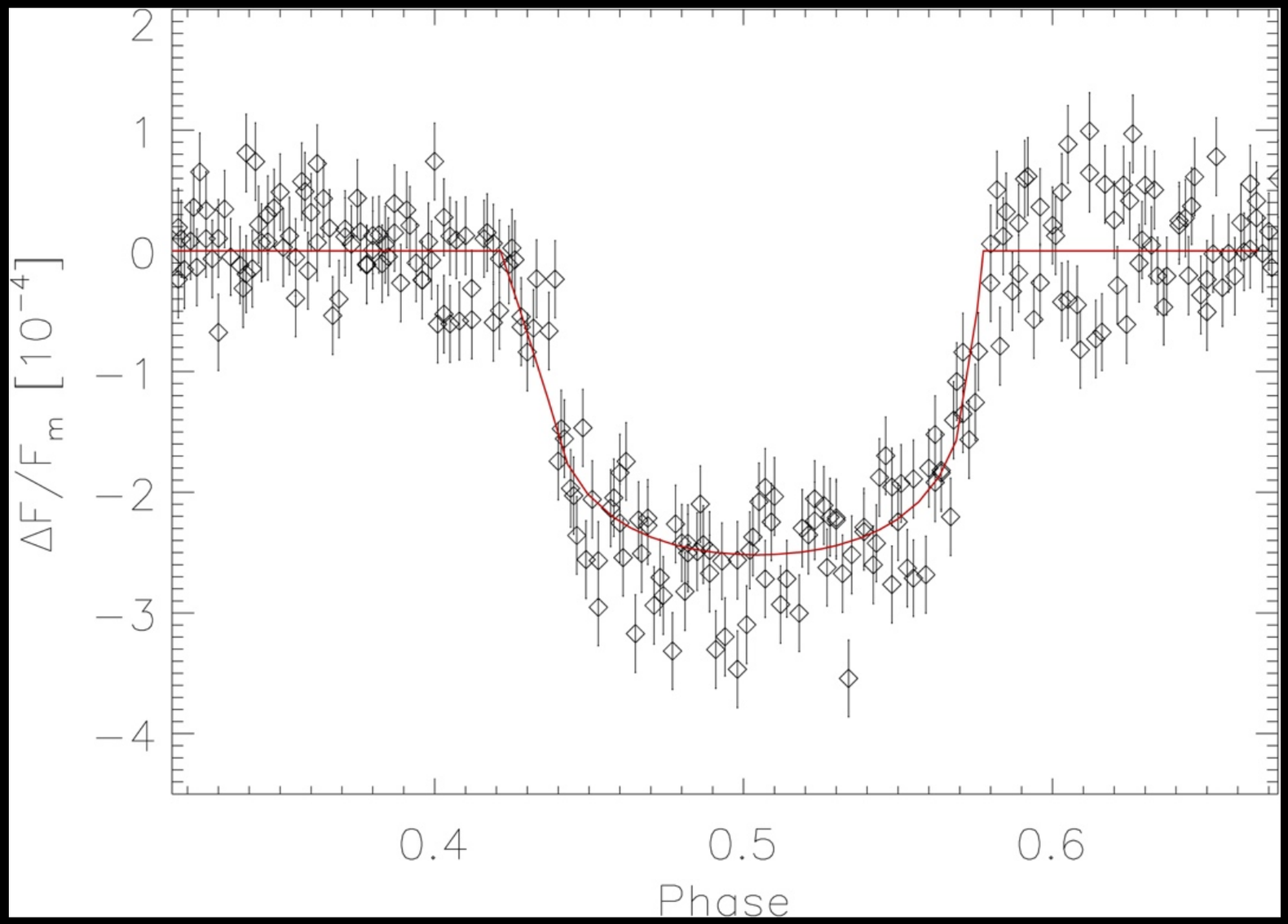
Long Timescale LC



Kepler - 5b

1. Periodic events (accuracy)
2. Unique Phenomena

An interesting system



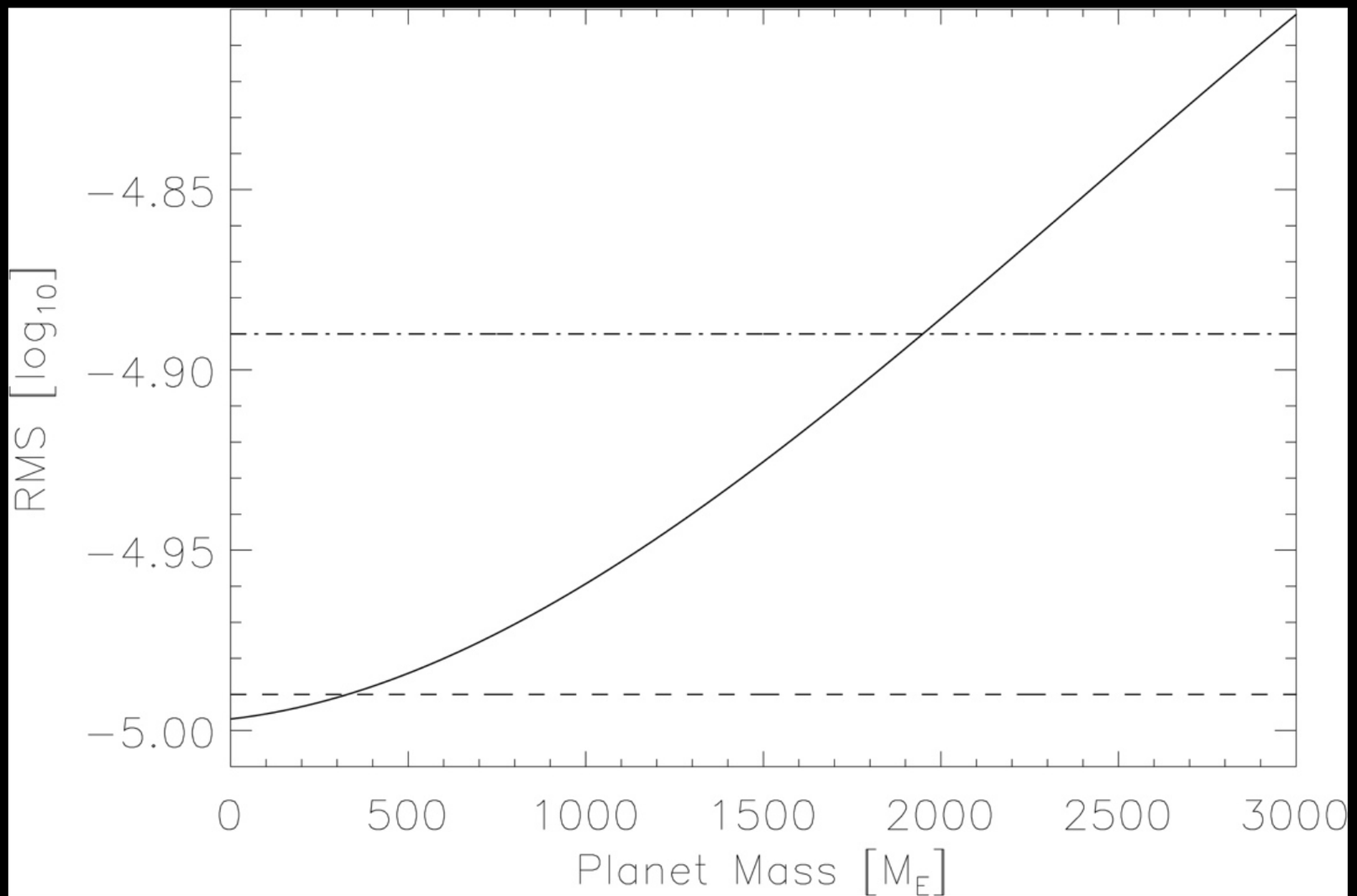
Star

G2V
Rs = 1.06Ro
Ms = 1.06Mo
Teff = 5658 K

Planet (?)

P = 5.4 d
Rp = 1.7 Re
a = 0.054 AU
Mp,m = 1.0 Mj

An interesting system

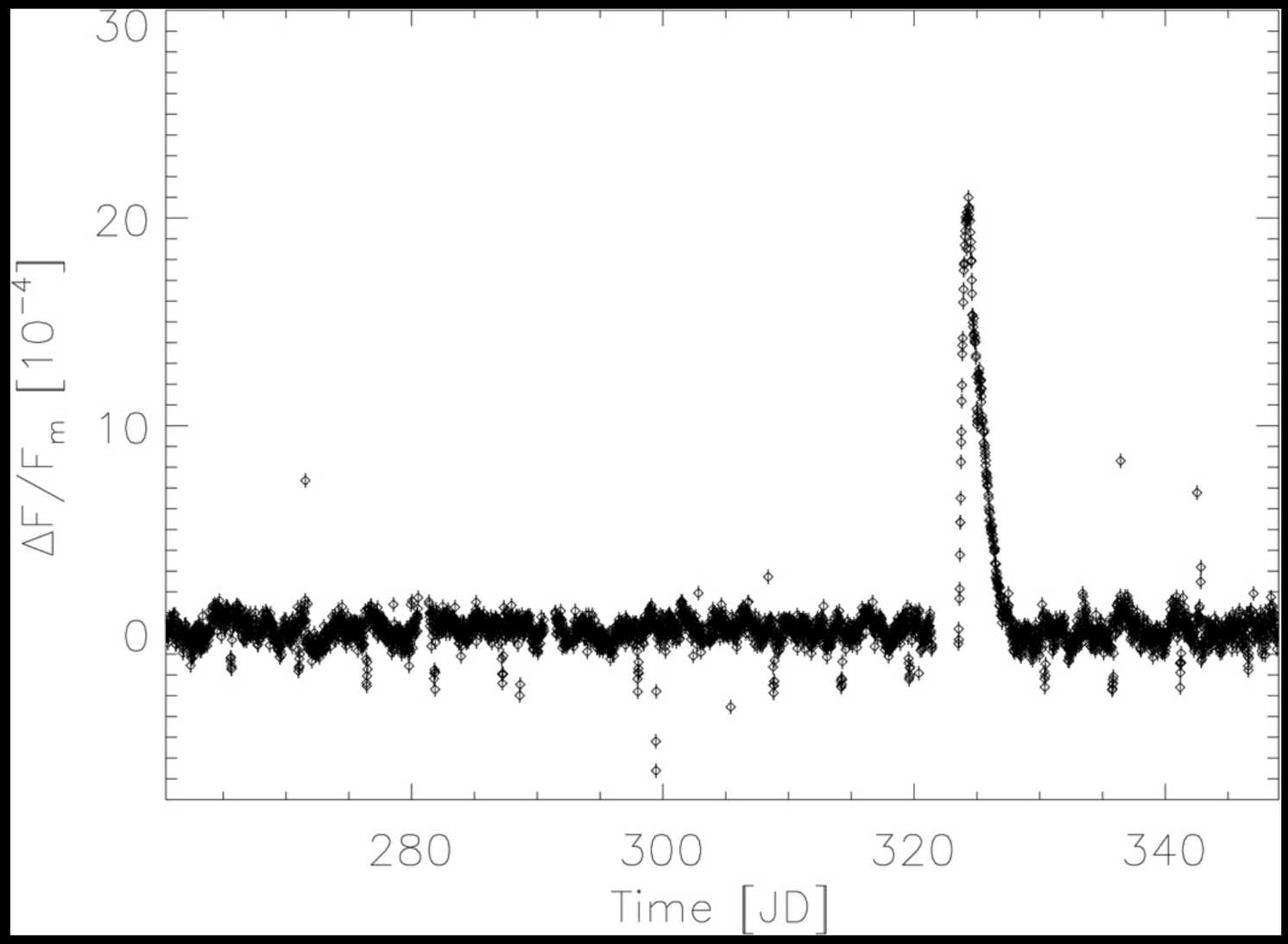


E.V. RMS

Mass upper limit (1σ) ~ 1.0 Mj

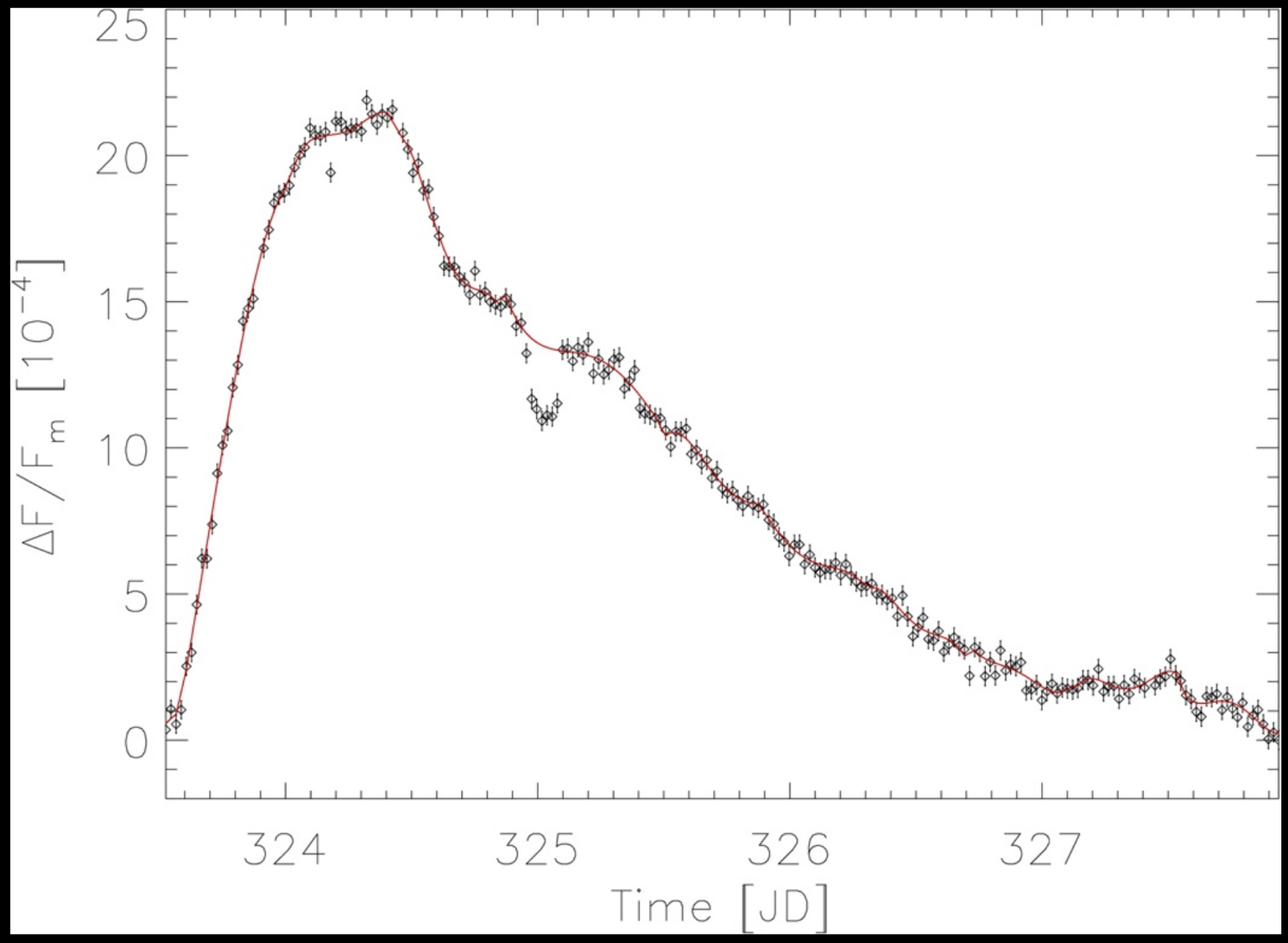
An interesting system

Stellar flare



An interesting system

Stellar flare
+
Transit

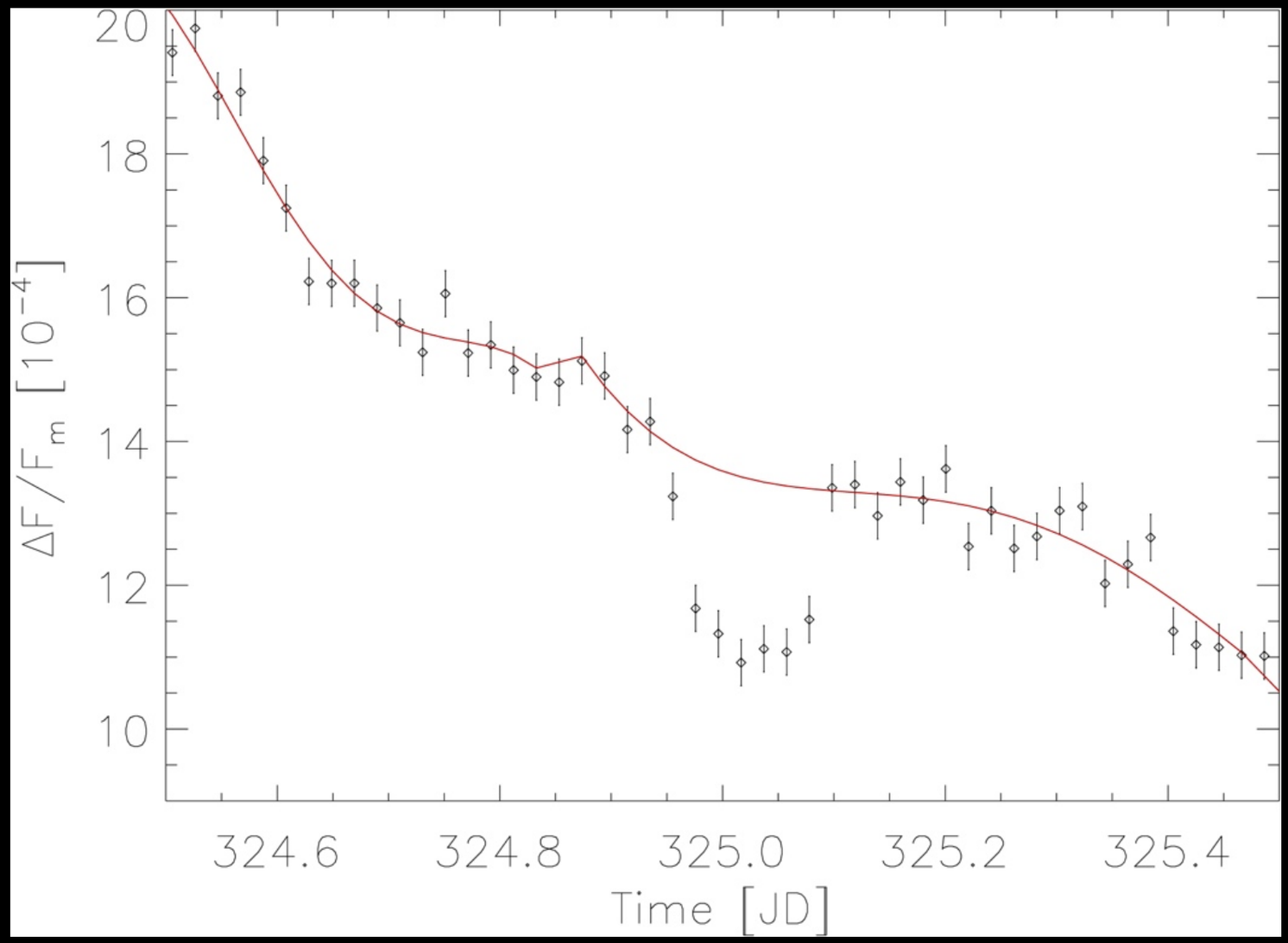


Mislis & Hodgkin 2012, MNRAS

An interesting system

Stellar flare
+
Transit

Energy : 6E+32 erg/sec
Duration 4.8 days



Mislis & Hodgkin 2012, MNRAS

Temp. increases fast ~ 200K

Thank you