HOMOGENEOUS STUDIES OF TRANSITING PLANETS

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Discovery rate of the transiting extrasolar planet population

- All transiting planets
- CoRoT
- HAT
- Kepler
- OGLE
- TrES
- WASP
- XO

Total number of planets

Year of discovery
Sky positions of the known transiting extrasolar planets

The symbol size is larger for the brighter systems (roughly proportional to the apparent V magnitude)
Mass versus radius of planets on the left and host stars on the right.
Homogeneous studies of transiting planets

- Light curve fit: JKTEBOP
- Limb darkening:
  - five different laws
- Contaminating light
  - constraints from high-resolution imaging

Light curve of WASP-2 (Southworth et al. 2009)
Homogeneous studies of transiting planets

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- Orbital eccentricity
  - constraints from RVs and occultation timings
- Numerical integration
  - deal with long Kepler and CoRoT exposure times

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- Error analyses
  - white noise: Monte Carlo
  - red noise: residual permutation
Homogeneous studies of transiting planets

- Physical properties from extra constraint:
  - five different stellar theoretical models
  - also try eclipsing binary calibration

Comparison between stellar models and eclipsing binary star systems
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- Now done 110 transiting systems
  - CoRoT, Kepler, KOI, HAT, GJ, HD, TrES, WASP, XO
- Southworth (2013) is still not submitted...
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- TEPCat: http://www.astro.keele.ac.uk/jkt/tepcat/