The discoveries of WASP-91b, WASP-105b and WASP-107b: two warm Jupiters and a planet in the transition region between ice giants and gas giants.*

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ABSTRACT

We report the discoveries of three transiting exoplanets. WASP-91b is a warm Jupiter (1.34 $M_{\text{Jup}}$, 1.03 $R_{\text{Jup}}$) in a 2.8-day orbit around a metal-rich K3 star. WASP-105b is a warm Jupiter (1.8 $M_{\text{Jup}}$, 0.96 $R_{\text{Jup}}$) in a 7.9-day orbit around a metal-rich K2 star. WASP-107b is a warm super-Neptune/sub-Saturn (0.12 $M_{\text{Sat}}$, 0.96 $R_{\text{Jup}}$) in a 5.7-day orbit around a solar-metallicity K6 star. Considering that giant planets seem to be more common around stars of higher metallicity and stars of higher mass, it is notable that the hosts are all metal-rich, late-type stars. With orbital separations that place both WASP-105b and WASP-107b in the weak-tide regime, measurements of the alignment between the planets’ orbital axes and their stars’ spin axes may help us to understand the inward migration of short-period, giant planets.

The mass of WASP-107b (2.2 $M_{\text{Sat}}$, 0.40 $M_{\text{Jup}}$) places it in the transition region between the ice giants and gas giants of the Solar System. Its radius of 0.94 $R_{\text{Jup}}$ suggests that it is a low-mass gas giant with a H/He-dominated composition. The planet thus sets a lower limit of 2.2 $M_{\text{Sat}}$ on the planetary mass above which large gaseous envelopes can be accreted and retained by proto-planets on their way to becoming gas giants. We may discover whether WASP-107b more closely resembles an ice giant or a gas giant by measuring its atmospheric metallicity via transmission spectroscopy, for which WASP-107b is a very good target.

Key words. planetary systems – stars: individual: WASP-91 – stars: individual: WASP-105 – stars: individual: WASP-107

1. Introduction

The observation that the fraction of stars with giant planets increases with both stellar metallicity and mass is suggestive of planetary formation by core accretion (e.g. Santos et al. 2004; Johnson et al. 2010). Under the core accretion model (e.g. Pollack et al. 1996), a gas giant results when planetesimals coagulate to form a rocky core, which then accretes a gaseous envelope. The Solar System’s giant planets, Jupiter and Saturn (0.30 $M_{\text{Sat}}$, 0.84 $R_{\text{Jup}}$), are more than 90% H/He by mass, which contrasts with the figure of 20% for the less massive (∼0.05 $M_{\text{Jup}}$) and smaller (∼0.35 $R_{\text{Jup}}$) ice giants, Neptune and Uranus (Guillot 2005). One challenge faced by models attempting to explain the formation of Neptune and Uranus is to avoid the runaway gas accretion that otherwise would have turned the planets into gas giants (e.g. Helled & Bodenheimer 2014).

Giant planets in few-day orbits, or ‘warm/hot Jupiters’, are thought to have formed farther out and then migrated inwards via interaction with the gas disc or via a high-eccentricity pathway (Lin et al. 1996; Rasio & Ford 1996). Planet-disc migration is expected to preserve alignment between the stellar spin and planetary orbital axes (e.g. Marzari & Nelson 2009), whereas high-eccentricity migration is expected to produce a broad range of misalignments (e.g. Fabrycky & Tremaine 2007). The ensemble of available measurements has been interpreted as evidence that hot Jupiters arise via high-eccentricity migration (Winn et al. 2010), though planet-disc migration is likely to play a role (e.g. Anderson et al. 2015b).
In this paper, we present the discoveries of three transiting exoplanets by the WASP survey: WASP-91b and WASP-105b are warm Jupiters orbiting metal-rich, early/mid-K stars; and WASP-107b is a warm super-Neptune/sub-Saturn orbiting a solar-metallicity, late-K star.

2. Observations

WASP-South images one third of the visible South-African sky (avoiding the galactic plane and the south pole) every ~10 minutes and is sensitive to the detection of giant planets transiting bright stars (V = 9–13). The survey and the search techniques are described in Pollacco et al. (2006) and Collier Cameron et al. (2006, 2007).

We routinely investigate the promising transit signals that we find in WASP lightcurves with the EulerCam imager and the CORALIE spectrograph, both of which are mounted on the 1.2-m Euler telescope, and the 0.6-m TRAPPIST imager and (Lendl et al. 2012; Queloz et al. 2000; Gillon et al. 2011; Jehan et al. 2011). We provide a summary of our observations of the three target stars in Table 1. TRAPPIST performed meridian flips at the following times (BJD—2.450000): 6560.756 (WASP-105 transit of 2013 September 24); 7001.546 (WASP-105 transit of 2014 December 9); 6428.575 (WASP-107 transit of 2013 May 15); and 6754.683 (WASP-107 transit of 2014 April 6). We portioned the resulting lightcurves prior to fitting to allow for flux offsets. We interpret the bump in the lightcurve of WASP-107 around mid-transit on 2013 Feb 18 as having been caused by the planet occulting a star spot.

The radial-velocity (RV) measurements that we computed using the CORALIE spectra exhibit variations with similar periods as the photometric dimmings seen in the WASP lightcurves and with amplitudes consistent with planetary-mass companions. The photometry and RVs are plotted for each system in Figures 1, 2 and 3. The absence of a significant correlation between bisection span and RV supports our conclusion that the observed periodic dimmings and RV variations are caused by transiting planets (Figure 4).

3. Stellar parameters from spectra

The individual CORALIE spectra were co-added after correcting for the orbital motion of the star, giving average S/N ratios of 55:1, 80:1 and 120:1 for WASP-91, WASP-105 and WASP-107, respectively. We performed the spectral analysis using the procedures detailed in Doyle et al. (2013). For each star the effective temperature (T$_{\text{eff}}$) was obtained using the Hr line and surface gravity (log g) was determined from the Na D and Mg b lines. Iron abundances were obtained from the analysis of equivalent width measurements of several unblended Fe I lines.

Projected equatorial rotation velocities ($v_r$ sin $I_\ast$) were determined by fitting the profiles of the Fe i lines after convolving with the instrumental resolution ($R = 55000$). For WASP-105 a macroturbulent velocity of 0.9 ± 0.3 km s$^{-1}$ was adopted from (Gray 2008). In the cases of WASP-91 and WASP-107, macroturbulence was assumed to be zero, since for mid/late K stars it is expected to be lower than that of thermal broadening (Gray 2008). The results are given in the top panel of Table 2.

4. Stellar rotation from lightcurve modulation

The WASP light curves of WASP-107 show a periodic modulation with an amplitude of about 0.4 per cent and a period of about 17 days. We assume this is due to the combination of the star’s rotation and magnetic activity, i.e., star spots. We used the sine-wave fitting method described in Maxted et al. (2011) to refine this estimate of the amplitude and period of the modulation. Variability due to star spots is not expected to be coherent on long timescales as a consequence of the finite lifetime of star-spots and differential rotation in the photosphere so we analysed the two seasons of data for WASP-107 separately. We removed the transit signal from the data prior to calculating the periodograms by subtracting a simple transit model from the lightcurve and also removed low-frequency noise by subtracting a straight line fit by least-squares to the data from each season. We calculated periodograms over 8192 uniformly spaced frequencies from 0 to 1.5 cycles/day. The false alarm probability (FAP) is calculated using a boot-strap Monte Carlo method also described in Maxted et al. (2011). The results are given in Table 3 and the periodograms and lightcurves are shown in Figure 5. There is a clear signal at a period of P = 17.1 d in the 2010 season of data that is also in the data from 2009 at P = 17.3 d, though at a lower significance. The periodogram of the data from 2009 also shows a peak at P = 8.3 d, which we assume is the second-harmonic of the rotation period due of multiple spot groups on surface of the star during this observing season. The strongest peak in this periodogram at 1.134 d can then be ascribed to the 1-day alias of this second-harmonic.

Assuming this to be the case, we obtain a value for the rotation period of $P_{\text{rot}} = 17 \pm 1$ d, where the error in this value is taken from the full-width at half-maximum of the peak in the periodogram of the data from 2010. This rotation period together with our estimate of the stellar radius (section 5) implies a value for the stellar rotation velocity of $v_r = 2.00 \pm 0.1$ km s$^{-1}$. This compares well with the spectroscopic estimate of the projected equatorial rotation velocity of $v_r \sin I_\ast = 2.5 \pm 0.8$ km s$^{-1}$. We used a least-squares fit of a sinusoidal function and its first harmonic to model the rotational modulation in the lightcurves for each camera and season with the rotation period fixed at $P_{\text{rot}} = 17.1$ d. We then subtracted this harmonic series fit from the original lightcurve prior to our analysis of the transit (section 5).

For WASP-91 and WASP-105 a similar analysis lead to upper limits with 95 per cent confidence of 0.8 mmag and 0.7 mmag.
for the amplitude of any sinusoidal signal over the same frequency range.

![Graph showing relative flux and radial velocity vs. orbital phase for WASP-91b discovery data.]

**Fig. 1.** WASP-91b discovery data. Top panel: WASP lightcurve folded on the transit ephemeris. Middle panel: Transit lightcurves from WASP (grey), TRAPPIST (green) and EulerCam (blue), offset for clarity, binned with a bin width of two minutes, and plotted chronologically with the most recent at the bottom. The best-fitting transit model is superimposed. Bottom panel: The CORALIE radial velocities with the best-fitting circular orbital model.
Fig. 2. WASP-105b discovery data. Caption as for Figure 1. Data partitioning due to TRAPPIST’s meridian flips are indicated by vertical dashed lines.

Fig. 3. WASP-107b discovery data. Caption as for Figure 1. The planet appears to have passed over a star spot during the transit of 2013 Feb 18, with a bump more evident in the lightcurve from EulerCam (Gunn r) than TRAPPIST (Sloan g). The difference is expected due to the bluer passband employed by EulerCam, in which the contrast between star spots and the surrounding photosphere will be greater. Also, the diameter of the TRAPPIST telescope is half that of the Euler telescope (0.6 m versus 1.2 m), so the data are noisier. Data partitioning due to TRAPPIST’s meridian flips are indicated by vertical dashed lines.
Fig. 4. The absence of correlation between bisector span and radial velocity for the three stars excludes transit mimics. The solid line is the best linear fit to the data and the dotted lines are the 1-$\sigma$ limits on the gradient. The Julian date of the observation (BJD – 2 450 000) is represented by the symbol colour.
It is interesting to note that all three Bakos et al. 2015, Enoch et al. 2010 (HA TS-8b), and Borsato et al. 2014 (Claret), though they are as expected from the Mandel & Agol 2002, and the circumbinary planet Kepler-35b; W ASP-91, W ASP-105, and W ASP-107, respectively. In our final MCMC analyses, we drew a value of ∼0.691 ± 0.025 Mr from an initial MCMC run and the values of Mr derived values, but it can be tested as it predicts both that ice giants in wide orbits depends on orbital distance due to the steep increase in the gas scale height in flaring discs. This hypothesis offers a neat explanation for the bifurcation of the giants of the Solar System and it can be tested as it predicts both that ice giants in wide orbits are common relative to gas giants and that those gas giants are enriched (core mass > 50 Mr).

WASP-107b has a mass 2.2 times that of Neptune and 0.40 times that of Saturn, but a radius 0.94 times that of Jupiter. This suggests that WASP-107b is a low-mass gas giant, with a H/He-dominated composition (Figure 6). We define a notional transition region between ice giants and gas giants which spans a planetary mass of between twice that of Neptune and half that of Saturn (0.11 Mr < Mp < 0.15 Mr). We know of five planets\(^1\) with masses in that region: WASP-10b, WASP-139b, HATS-7b (Bakos et al. 2015), HATS-8b (Bayliss et al. 2015), and the circumbinary planet Kepler-35b.

\(^1\) We excluded Kepler-9b and Kepler-9c as there is considerable uncertainty regarding their masses, which were inferred from transit-timing variations (Holman et al. 2010; Borsato et al. 2014; Hadden & Lithwick 2014).

6. Discussion

WASP-91b, a 1.34-M\(_{\text{Jup}}\) planet in a 2.8-day orbit around a K3 star, is the southern-most transiting planet known. WASP-105b is a 1.8-M\(_{\text{Jup}}\) planet in a 7.9-day orbit around a K2 star. Finally, WASP-107b is a 0.12-M\(_{\text{Jup}}\) planet in a 5.7-day orbit around a K6 star. Together with WASP-139b (Mr = 0.12 ± 0.02 Mr, Hellier et al. 2016), WASP-107b is the lowest-mass planet discovered by WASP to date; the next lowest are WASP-29b (0.24 Mr, Hellier et al. 2010) and WASP-69b (0.26 Mr, Anderson et al. 2014). Giant planets seem to be more common around both stars of higher metallicity and stars of higher mass (e.g. Santos et al. 2004; Johnson et al. 2010). It is interesting to note that all three hosts are K stars and that WASP-91 and WASP-105 are metal rich, whilst the super-Neptune host, WASP-107, is solar metallicity.

WASP-91b (1.03 R\(_{\text{Jup}}\)) and WASP-105b (0.96 R\(_{\text{Jup}}\)) are notable as having radii towards the lower end of the envelope for hot Jupiters (Figure 6), though they are as expected from the empirical relation of Enoch et al. (2012) based on their semi-major axes and relatively low equilibrium temperatures. WASP-107b occupies a sparsely populated region in the planetary mass-radius diagram, with a mass 2.2 times that of Neptune and 0.40 times that of Saturn (Figure 6). The planet’s radius is toward the upper end of the super-Neptune/sub-Saturn regime and it is higher than expected from the empirical relation of Enoch et al. (2012) by around 0.30 R\(_{\text{Jup}}\), perhaps suggestive of a low-metallicity composition.

6.1. WASP-107b and the transition between ice giants and gas giants

Under the core accretion model of planet formation, planetesimals coagulate to form a rocky core, which rapidly accretes a gaseous envelope once a critical mass of ~10 Mr\(_{\text{Earth}}\) is reached (Mizuno et al. 1978). One challenge for planet formation models is to explain why ice giants did not become gas giants. Lambrichts et al. (2014) suggested core growth via the accretion of pebbles, rather than planetesimals, as a solution. Under this hypothesis, beyond a threshold mass, a core can halt the accretion of pebbles by gravitationally perturbing the surrounding disc. The gas envelope surrounding the core is then no longer supported by accretion heat and so rapidly collapses, resulting in a gas giant. Ice giants do not reach this threshold mass, which depends on orbital distance due to the steep increase in the gas scale height in flaring discs. This hypothesis offers a neat explanation for the bifurcation of the giants of the Solar System and it can be tested as it predicts both that ice giants in wide orbits are common relative to gas giants and that those gas giants are enriched (core mass > 50 Mr).
Table 2. System parameters

| Parameter                              | Symbol (Unit) | WASP-91     | WASP-105    | WASP-107    |
|----------------------------------------|---------------|-------------|-------------|-------------|
| Stellar parameters, including from the spectra:|               |             |             |             |
| Constellation                          |               | Tucana      | Phoenix     | Virgo       |
| Right Ascension                        |               | 23h51m22s89 | 01h36m40s24 | 12h33m32s84 |
| Declination                            |               | −70°09′10″/2 | −50°39′32″/5 | −10°08′46″/1 |
| V<sub>mag</sub>                         |               | 12.0        | 12.1        | 11.6        |
| K<sub>mag</sub>                         |               | 9.7         | 9.9         | 8.6         |
| Spectral type<sup>c</sup>              |               | K3          | K2          | K6          |
| Stellar effective temperature<sup>b</sup> | T<sub>eff</sub> (K) | 4920 ± 80 | 5070 ± 130 | 4430 ± 120 |
| Stellar surface gravity<sup>a</sup>    | log g<sub>s</sub> (cgs) | 4.3 ± 0.2 | 4.2 ± 0.2 | 4.5 ± 0.1 |
| Projected equatorial rotation velocity<sup>c</sup> | v<sub>s</sub> sin i<sub>L</sub> (km s<sup>−1</sup>) | 2.4 ± 0.4 | 1.7 ± 1.9 | 2.5 ± 0.8 |
| Stellar metallicity<sup>b</sup>        | [Fe/H]        | +0.19 ± 0.13 | +0.28 ± 0.16 | +0.02 ± 0.10 |
| Lithium abundance<sup>c</sup>          | log A(Li)     | <0.5        | <0.2        | <−0.3       |

MCMC proposal parameters:

| Parameter                              | Symbol (Unit) | WASP-91     | WASP-105    | WASP-107    |
|----------------------------------------|---------------|-------------|-------------|-------------|
| Orbital period<sup>c</sup>             | P (d)         | 2.798581 ± 0.000003 | 7.87288 ± 0.000001 | 5.721490 ± 0.000002 |
| Epoch of mid-transit                   | T<sub>e</sub> (BJD) | 2456297.7190 ± 0.0002 | 2456600.7065 ± 0.0002 | 2456514.4106 ± 0.0001 |
| Transit duration<sup>c</sup>           | T<sub>tr</sub> (d) | 0.0976 ± 0.0008 | 0.1550 ± 0.0006 | 0.1147 ± 0.0003 |
| Planet-to-star area ratio<sup>c</sup>  | R<sub>p</sub>R<sup>2</sup> / R<sup>2</sup> | 0.0150 ± 0.0003 | 0.0120 ± 0.0001 | 0.0217 ± 0.0002 |
| Impact parameter<sup>c</sup>           | b             | 0.51 ± 0.04 | 0.10 ± 0.08 | 0.09 ± 0.07 |
| Stellar reflex velocity semi-amplitude<sup>c</sup> | K<sub>r</sub> (m s<sup>−1</sup>) | 217 ± 5 | 194 ± 3 | 17 ± 2 |
| Systemic velocity<sup>c</sup>          | γ (m s<sup>−1</sup>) | 2782 ± 4 | 24676 ± 2 | 14160 ± 2 |
| Orbital eccentricity<sup>c</sup>       | e             | 0 (adopted; <0.07 at 2σ) | 0 (adopted; <0.04 at 2σ) | 0 (adopted; <0.4 at 2σ) |

MCMC derived parameters:

| Parameter                              | Symbol (Unit) | WASP-91     | WASP-105    | WASP-107    |
|----------------------------------------|---------------|-------------|-------------|-------------|
| Scaled orbital separation              | a/R<sub>s</sub> | 9.1 ± 0.3 | 17.9 ± 0.2 | 18.2 ± 0.1 |
| Orbital inclination                    | i (°)         | 86.8 ± 0.4 | 89.7 ± 0.2 | 89.7 ± 0.2 |
| Transit ingress/egress duration<sup>c</sup> | T<sub>2</sub> / T<sub>1</sub> | 0.0139 ± 0.0009 | 0.0154 ± 0.0003 | 0.0148 ± 0.0002 |
| Stellar mass<sup>b</sup>               | M<sub>∗</sub> (M<sub>Jup</sub>) | 0.84 ± 0.07 | 0.89 ± 0.09 | 0.69 ± 0.05 |
| Stellar radius<sup>c</sup>             | R<sub>s</sub> (R<sub>Jup</sub>) | 0.86 ± 0.03 | 0.90 ± 0.03 | 0.66 ± 0.02 |
| Stellar surface gravity                | log g<sub>s</sub> (cgs) | 4.49 ± 0.03 | 4.48 ± 0.02 | 4.64 ± 0.01 |
| Stellar density<sup>c</sup>            | ρ<sub>s</sub> (ρ<sub>Jup</sub>) | 1.3 ± 0.1 | 1.23 ± 0.03 | 2.45 ± 0.01 |
| Planetary mass<sup>b</sup>             | M<sub>p</sub> (M<sub>⊕</sub>) | 1.34 ± 0.08 | 1.8 ± 0.1 | 1.02 ± 0.09 |
| Planetary radius<sup>b</sup>           | R<sub>p</sub> (R<sub>⊕</sub>) | 1.03 ± 0.04 | 0.96 ± 0.03 | 0.94 ± 0.02 |
| Planetary surface gravity              | log g<sub>p</sub> (cgs) | 3.46 ± 0.03 | 3.64 ± 0.01 | 2.49 ± 0.05 |
| Planetary density<sup>c</sup>          | ρ<sub>p</sub> (ρ<sub>⊕</sub>) | 1.2 ± 0.1 | 2.0 ± 0.1 | 0.14 ± 0.02 |
| Orbital major semi-axis<sup>c</sup>    | a (au)        | 0.037 ± 0.001 | 0.075 ± 0.003 | 0.055 ± 0.001 |
| Planetary equil. temperature<sup>c</sup> | T<sub>eff</sub> (K) | 1160 ± 30 | 900 ± 20 | 770 ± 60 |

Notes. (a) Iron abundances are relative to the solar values of Asplund et al. (2009). (b) Spectral type estimated from T<sub>eff</sub> using the table in Gray (2008). (c) Impact parameter is the distance between the centre of the stellar disc and the transit chord: b = a cos i/R<sub>s</sub>. (d) Equilibrium temperature calculated assuming zero albedo and efficient redistribution of heat from the planet’s presumed permanent day-side to its night-side.

Table 3. Periodogram analysis of the WASP lightcurves for WASP-107.

| Season | Dates | N | P [d] | a [mmag] | FAP |
|--------|-------|---|-------|---------|-----|
| 2009   | 4867−5010 | 4029 | 1.134 | 0.003 | 0.056 |
| 2010   | 5233−5376 | 5315 | 17.17 | 0.004 | <0.001 |

Notes. Observing dates are JD − 2450000. N is the number of observations used in the analysis, a is the semi-amplitude of the best-fit sine wave at the period P found in the periodogram with false-alarm probability FAP.

(Welsh et al. 2012). We may be able to discern whether these planets more closely resemble ice giants or gas giants by measuring their atmospheric metallicities, which is achievable by measuring their atmospheric H₂O abundances via transmission spectroscopy with HST (e.g. Kreidberg et al. 2014). The atmospheric metallicities of Neptune and Uranus, the Solar System’s ice giants, are far higher than that of Jupiter and Saturn, the Solar System’s gas giants: with C/H ≈ 80 times the proto-solar abundance as compared to 4–10 times (Guillot & Gautier 2014). By measuring the atmospheric metallicity of planets in the transition region, we may gain insight into the planetesimal-accretion history of the planet and better understand both the formation pathways of ice giants and gas giants and the transition from one class to the other. For each planet in the transition region, we calculated their predicted atmospheric transmission signal (i.e. the product of the star’s K-band flux and the area ratio of the planetary atmosphere’s annulus to the stellar disc; Table 4). This suggests that WASP-107b is the most favourable target for transmission spectroscopy in the transition region by an order of magnitude. Further, it is predicted to be an order of magnitude more favourable than WASP-43b, whose H₂O abundance was measured recently (Kreidberg et al. 2014).

6.2. The migration of short period, giant planets

WASP-105b and WASP-107b could help us to understand the inward migration of hot Jupiters. To date, the orbits of planets in short orbits around cool stars (T<sub>eff</sub> < 6250 K) have been found to be near-circular and near-aligned with the stellar spins, whereas planets in longer orbits, therefore experiencing weaker tidal forces, tend to be eccentric and/or misaligned (Albrecht et al. 2012; Anderson et al. 2015b). This has been interpreted as evidence for high-eccentricity migration, in which a cold Jupiter is perturbed into an eccentric, misaligned orbit that is then circu-
By measuring the spin-orbit angle for a sample of planets in relatively wide orbits, for which tidal effects will be smaller, we can determine the relative contributions of migration pathways. With scaled orbital separations of $a/R_\ast \approx 18$, both WASP-105 and WASP-107 lie beyond the empirical boundary between aligned and misaligned systems ($a/R_\ast \approx 15$) and so would be interesting targets in that respect. If the planets underwent high-eccentricity migration then we may expect their orbits to be eccentric and/or misaligned (e.g. Fabrycky & Tremaine 2007), whereas near-circular and near-aligned orbits may be expected if they underwent planet-disc migration (e.g. Marzari & Nelson 2009). We placed an upper limit of $e < 0.04$ at 2 $\sigma$ for WASP-105b, but the constraint is much weaker for WASP-107b ($e < 0.4$ at 2 $\sigma$) due to the lower mass of the planet and therefore the smaller amplitude of the stellar reflex motion. With a scaled separation of $a/R_\ast \approx 9$, WASP-91b is expected to be in a near-aligned and near-circular orbit; indeed, we found $e < 0.07$ at 2 $\sigma$. The most common method employed to measure spin-orbit angles is to measure the apparent radial-velocity shift that occurs during transit (e.g. Albrecht et al. 2012). The predicted semi-amplitude of the RV shift is $20$, $13$ and $35$ m s$^{-1}$ for WASP-91, -105 and -107, respectively. An alternative possibility for WASP-107 is to infer the spin-orbit angle from the spot-crossing times measured over multiple transits (Sanchis-Ojeda et al. 2011; Nutzman et al. 2011). This could be done soon as WASP-107 was observed during Campaign 10 of the K2 mission (Howell et al. 2014; Kepler Guest Observer proposal 8060, PI: Anderson).

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