

# High-precision photometry by telescope defocussing – VIII. WASP-22, WASP-41, WASP-42 and WASP-55

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## Abstract

We present 13 high-precision and four additional light curves of four bright southernhemisphere transiting planetary systems: WASP-22, WASP-41, WASP-42 and WASP-55. In the cases of WASP-42 and WASP-55, these are the first follow-up observations since their discovery papers. We present refined measurements of the physical properties and orbital ephemerides of all four systems. No indications of transit timing variations were seen. All four planets have radii inflated above those expected from theoretical models of gas-giant planets; WASP-55 b is the most discrepant with a mass of  $0.63 M_{\text{Jup}}$  and a radius of  $1.34 R_{\text{Jup}}$ . WASP-41 shows brightness anomalies during transit due to the planet occulting spots on the stellar surface. Two anomalies observed 3.1 d apart are very likely due to the same spot. We measure its change in position and determine a rotation period for the host star of  $18.6 \pm 1.5$  d, in good agreement with a published measurement from spot-induced brightness modulation, and a sky-projected orbital obliquity of  $? = 6 \pm 11^\circ$ . We conclude with a compilation of obliquity measurements from spot-tracking analyses and a discussion of this technique in the study of the orbital configurations of hot Jupiters.

## Keywords

Stars: fundamental parameters, Stars: individual: WASP-22, WASP-41, WASP42, WASP-55, Planetary systems.