

DETECTING THE RELATIVISTIC BEAMING EFFECT IN ECLIPSING BINARIES WITH KEPLER

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We propose to observe a set of known eclipsing binaries in the Kepler field, in order to detect a small periodic intensity modulation with the binary period, due to relativistic effect, never observed so far. The intensity modulation depends on the radial velocity of the two stars, and therefore can be used as photometric radial-velocity measurements, allowing to determine or at least constrain the binary masses. We expect the amplitude of the effect to be of the order of 100 ppm or more. We can detect this effect with 5 sigma significance for stars with non-periodic stellar jitter of 1000 ppm. We apply now for a modest set of eclipsing binaries, so we can establish the ability of Kepler to perform this novel kind of observations.