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Title: Characterizing microlensing planets with Kepler
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Abstract: Kepler has a unique opportunity to probe a region of exoplanetary parameter space exceeding even its original, ambitious design specification: cool planets orbiting several AU from their host stars. By observing dense star fields in the Galactic Plane, Kepler can obtain continuous coverage of microlensing events being simultaneously observed from the ground. The physical separation between these two platforms is sufficient for them to measure significantly different times of event peak, projected lens-source separation and Einstein crossing time. This yields a degeneracy-breaking estimate of the parallax, allowing the component masses of the lensing system to be measured to a precision that has only been possible for a handful of systems to date. We estimate that Kepler could add at least two mass measurements per year, in addition to characterizing all brown dwarf binary lenses and single-lens events caused by compact objects like black holes, neutron stars and brown dwarfs, which are not otherwise observable. We advocate a pilot program which could lay the ground work for a larger scale program in a future mission.