



A new method for determining detection efficiency: Characterizing the ensemble detection statistics for the Kepler pipeline

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Abstract

There are many factors which must be considered in order to address Kepler's primary mission goal - measuring the frequency of Earth-size planets in the habitable zones of solar-like stars[1]. One of these is the detection completeness of the Kepler pipeline[2], in other words what fraction of the detectable transiting planets are being recovered. However, since Kepler will obtain over 8 billion observations during the nominal mission, characterizing the pipeline detection efficiency in the traditional Monte Carlo manner is computationally infeasible. We describe a new method of measuring the ensemble statistics for completeness, investigating the detection efficiency as a function of stellar and planetary parameters. We present the first results from the study, and the implications for Kepler's ability to measure η_{Earth} .

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References

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- [2] Jenkins, J. M., et al.: Overview of the Kepler Science Processing Pipeline, *Astrophysical Journal*, Vol 713, pp L87-L91, 2010.