

**Use of the Deep Impact HRI Instrument to Observe Exoplanets
Via Microlensing**

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Abstract: The Deep Impact mission, launched in January 2005, culminated in July 2005 with the delivery of the Impactor spacecraft to the surface and flyby of comet 9P/Tempel 1. In 2007 an extended mission was approved utilizing the Deep Impact Flyby spacecraft. This mission was to observe stars with known transiting planets and use photometric methods to characterize these planets. These observations were done while in cruise towards the spacecraft's next destination – comet 103P/Hartley 2. This second comet flyby was accomplished in November 2010. The spacecraft is healthy and continues in its heliocentric orbit while awaiting a second extended mission decision. NASA has approved several observations utilizing the Deep Impact Flyby spacecraft in 2012 as preparations for future science observations. One of these is to observe microlensing events from the spacecraft in conjunction with ground observations. The spacecraft will be able to observe the galactic bulge in the early summer of 2012, and the team is preparing to implement these observations. The strategy will make extensive use of operational techniques developed and used during the EPOCh observation campaign. It will also require operational agility to be able to respond to identified microlensing events. These observations will establish the viability of using the DI spacecraft as a platform to complement earth based microlensing observations for characterizing small, icy exoplanets. The challenges and strategies for implementing these observations will be discussed. If NASA approves an extended mission, these types of observations could account for a diverse suite of science observations accomplished with this workhorse spacecraft. The work described herein was carried out at the Jet Propulsion Laboratory, California Institute of Technology under a contract with the National Aeronautics and Space Administration.