

Real Time Microlensing Support for K2 C9

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We propose to provide real-time microlensing support for K2 C9 in two forms. First, we will provide real-time microlensing alerts based on the existing, well-functioning OGLE Early Warning System (EWS). Second, we will develop methods to employ these alerts to enhance ground-based followup observations, based on extensive experience in analogous activities related to ongoing space-based microlensing using the Spitzer satellite.

Real time alerts are crucial to obtaining followup data while the events are in progress. These followup data can take a variety of forms, including (but not limited to) high-cadence data on events that are sensitive to planets or that are undergoing planetary anomalies, and infrared (IR) observations at substantial magnification for later comparison with AO IR observations at baseline. As discovered in the course of preparing for the 2015 Spitzer campaign, such followup observations can take place well outside the spacecraft window. Developing criteria for rational allocation of limited followup resources requires considerable expertise and experience.

The two investigators have the required expertise and experience. Gould is PI of the Microlensing Follow Up Network (microFUN) which has carried out such observations for 12 years. He is also PI of the two Spitzer microlensing campaigns, 100 hrs in 2014 and 832 hrs in 2015. He co-authored the first paper to propose K2-type observations (Gould & Horne 2013), which was also the first to propose K2 microlensing. Udalski is PI of the OGLE project, which is the longest running, most precise, and most productive microlensing experiment to date. In particular, he created the OGLE EWS (Udalski et al. 1994) and several improvements, and he daily operates this system, which produces 3 times more alerts than its only competitor (the MOA experiment).

While in principle it is possible that in the next 10 months someone will develop an alert system comparable to OGLE EWS, this is extremely unlikely. Hence, it is almost certain that the main guide to real-time microlensing work will come from OGLE EWS.

Gould, A., & Horne, K. 2013, ApJ, 779, 28
Udalski, A., et al. 1994, Acta Astron., 44, 317