

Photometric Observations of Known Variable Sources from AAVSO

Kepler 2 Field 0 Proposal

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The prime Kepler Mission has clearly demonstrated its ability to discover and characterize planets around other stars and stellar binaries and multiples of all kinds. **We propose to observe ~2500 known variable stars of all types** to continue observations of previously identified variability.

This proposal is one of multiple similar proposals aimed at identifying known variable targets in the fields in a variety of ways. These systems were identified using the International Variable Star Index (VSX) hosted by the American Association of Variable Star Observers (AAVSO) available on aavso.org. AAVSO covers a large range of heterogeneous targets known to be photometrically variable for a wide variety of reasons. For example, the ASAS EBs submitted in a separate proposal are a subset of these targets. We identified all known VSX systems within 12 degrees of the proposed Field 0 boresight (RA (J2000) = $06^{\text{h}} 47^{\text{m}} 00^{\text{s}}$, Dec (J2000) = $+21^{\circ} 22' 47''$).

By targeting known variable binary stars, the probability of valuable science is higher than picking a random field star. Hence, the science yield is likely to be higher. Recall that dozens of important papers regarding stellar variability have already been produced based on Kepler data. These targets have a high probability of similar scientific returns.

Furthermore, the proposed targets are doubly valuable due to some pre-existing data and analysis. Binaries identified from lists of known binaries must already have significant eclipsing binary solutions. This will enhance the understanding and interpretation of any Kepler 2 Field 0 photometric data that is obtained on such targets.

We consider these targets to be of low, but non-zero priority. Given the large number of targets (~2500), we expect considerable overlap with other proposals. We recommend that these stars be included in priority as potentially comparable to padding the list with field dwarfs of similar magnitude for an exoplanet search.

Thanks to the Kepler 2 Mission Team for coordinating these proposals.