We present a carefully controlled set of Spitzer 24 μm MIPS time series observations of the newly discovered low mass eclipsing binary star GU Boötes. These observations serve to characterize the MIPS-24 observing techniques of the space telescope, precisely establishing the photometric repeatability of this instrument at the tens of μJy level. These data serve to substantiate the previously announced GO-1 and upcoming GO-2 observations of extrasolar planet transits at similar levels of precision. The ancillary science return is the first-ever long wavelength characterization of such an object’s light curve, allowing for improved characterization of the primary and secondary component linear radii, in addition to other aspects of their surface morphology.

Table 1: Spitzer MIPS-24 Observations of GU Boötes

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<th>Date</th>
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<th>Exposures</th>
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* in seconds per exposure

**What is GU Boötes?**
- GU Boötes is a nearby, low-mass eclipsing binary system, consisting of two M-dwarfs (López-Morales & Ribas 2005).
- The nearly equal mass binary system was only recently discovered in 2005.

**Why is GU Boötes important?**
- Very few (<5 pair) double-lined, detached eclipsing low-mass binaries are known.
- Eclipsing binaries can be used to ascertain fundamental stellar properties such as mass, linear radius, and effective temperature.

**Observations**
- 24 μm MIPS data were obtained as described in Table 1, below.
- Two secondary eclipse events were recorded in MIPS campaign 29, a third was observed during MIPS campaign 30.
- Two events within a campaign, along with a second campaign, were selected as a means by which to test MIPS repeatability from event to event, over the short- and long-term.
- 24 μm observations were selected as being minimally affected by limb darkening and/or spots for M-dwarfs.

**Conclusions (thus far)**
- Spitzer absolute repeatability from observing campaign to campaign appears to be good at the <10 μJy level. Intra-campaign repeatability levels are even better.
- 24 μm light curves for GU Boötes appear to be uncontaminated by surface morphology compared to their optical counterparts.

**To-Do List**
- Derive more fundamental stellar parameters; in particular, compare diameter indicated at 24 μm with R- and I-band values.
- Derive individual component 24μm fluxes and compare to SED fits for stars.
- Compare point-response fitting photometry provided by apox to aperture photometry values.

**References**