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ExploreNEOs: The Warm Spitzer Near Earth Object Characterization Survey

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ABSTRACT

We have carried out the Warm Spitzer Near Earth Object (NEO) Characterization survey (ExploreNEOs). We observed some 600 NEOs at 3.6 and 4.5 microns during the period 2009—2012. For each object we derive, through thermal modeling, diameter and albedo. Our results have been presented in a series of papers. To date, we have released almost all of our data and diameter and albedo solutions (Trilling et al. 2010, 2013). We compared the fidelity of our model solutions to “ground truth” data from other sources (Harris et al. 2011). We calculated statistical temperature histories for low delta-V objects (Mueller et al. 2011). We calculated the

density of binary objects in our sample (Kistler et al. 2013). We derived the mean albedo for different taxonomic asteroid types (Thomas et al. 2011). We have carried out an extensive ground-based observing campaign and derived new absolute magnitudes for 100 NEOs, and derived an empirical correction from JPL/Horizons values that can be applied to all NEOs (Hagen et al. 2013). We have measured the fraction of NEOs that are likely of cometary origin (Mommert et al. 2013). Forthcoming papers will present additional ancillary ground-based data; a discussion of the probable source regions of NEOs, and the implications thereof; and results for a number of targets that were observed multiple times to understand the impact of phase angle and rotational variation on our model solutions. Together, these results help us constrain the global properties of NEOs and the evolution of the material in near-Earth space.