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Abstract Title: **Phase-Angle Dependence of Determinations of Diameter, Albedo, and Taxonomy: A case study of NEO 3691 Bede**

Parameters important for NEO risk assessment and mitigation include Near-Earth Object diameter and taxonomic classification, which translates to surface composition. Diameters of NEOs are derived from the thermal fluxes measured by WISE, NEOWISE, Spitzer Warm Mission and ground-based telescopes including the IRTF and UKIRT. Diameter and its coupled parameters Albedo and IR beaming parameter (a proxy for thermal inertia and/or surface roughness) are dependent upon the phase angle, which is the Sun-target-observer angle. Orbit geometries of NEOs, however, typically provide for observations at phase angles > 20 degrees. At higher phase angles, the observed thermal emission is sampling both the day and night sides of the NEO. We compare thermal models for NEOs that exclude (NEATM) and include (NESTM) night-side emission.

We present a case study of NEO 3691 Bede, which is a higher albedo object, X (Ec) or Cgh taxonomy, to highlight the range of H magnitudes for this object (depending on the albedo and phase function slope parameter G), and to examine at different phase angles the taxonomy and thermal model fits for this NEO. Observations of 3691 Bede include our observations with IRTF+SpeX and with the 10μm UKIRT+Michelle instrument, as well as WISE and Spitzer Warm mission data. By examining 3691 Bede as a case study, we highlight the interplay between the derivation of basic physical parameters and observing geometry, and we discuss the uncertainties in H magnitude, taxonomy assignment amongst the X-class (P, M, E), and diameter determinations. Systematic dependencies in the derivation of basic characterization parameters of H-magnitude, diameter, albedo and taxonomy with observing geometry are important to understand. These basic characterization parameters affect the statistical assessments of the NEO population, which in turn, affects the assignment of statistically-assessed basic parameters to discovered but yet-to-be-fully-characterized NEOs.