From: ts.acsupport@thomson.com
Subject: DPS 48/EPSC 11 Meeting Abstract Submitted: (2567657)
Date: June 21, 2016 at 2:28 PM
To: dwooden@mac.com

Dear Dr. Diane Wooden,

Your abstract (Control ID: 2567657):

Characterization of the high-albedo NEA 3691 Bede
Abstract (2,250 Maximum Characters)
Characterization of NEAs provides important inputs to models for atmospheric entry, risk assessment and mitigation. Diameter is a key parameter because diameter translates to kinetic energy in atmospheric entry. Diameters can be derived from the absolute magnitude, H(PA=0deg), and from thermal modeling of observed IR fluxes. For both methods, the albedo (pv) is important – high pv surfaces have cooler temperatures, larger diameters for a given Hmag, and shallower phase curves (larger slope parameter G). Thermal model parameters are coupled, however, so that a higher thermal inertia also results in a cooler surface temperature. Multiple parameters contribute to constraining the diameter.

Observations made at multiple observing geometries can contribute to understanding the relationships between and potentially breaking some of the degeneracies between parameters. We present data and analyses on NEA 3691 Bede with the aim of best constraining the diameter and pv from a combination of thermal modeling and light curve analyses. We employ our UKIRT+Michelle mid-IR photometric observations of 3691 Bede's thermal emission at 2 phase angles (27&43 deg 2015-03-19 & 04-13), in addition to WISE data (33deg 2010-05-27, Mainzer+2011).

Observing geometries differ by solar phase angles and by moderate changes in heliocentric distance (e.g., further distances produce somewhat cooler surface temperatures). With the NEATM model and for a constant IR beaming parameter (eta=constant), there is a family of solutions for (diameter, pv, G, eta) where G is the slope parameter from the H-G Relation. NEATM models employing Pravec+2012's choice of G=0.43, produce D=1.8 km and pv≈0.4, given that G=0.43 is assumed from studies of main belt asteroids (Warner+2009). We present an analysis of the light curve of 3691 Bede to constrain G from observations. We also investigate fitting thermophysical models (TPM, Rozitis+11) to constrain the coupled parameters of thermal inertia (Gamma) and surface roughness, which in turn affect diameter and pv. Surface composition can be related to pv. This study focuses on understanding and characterizing the dependency of parameters with the aim of constraining diameter, pv and thermal inertia for 3691 Bede.

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Sincerely,

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