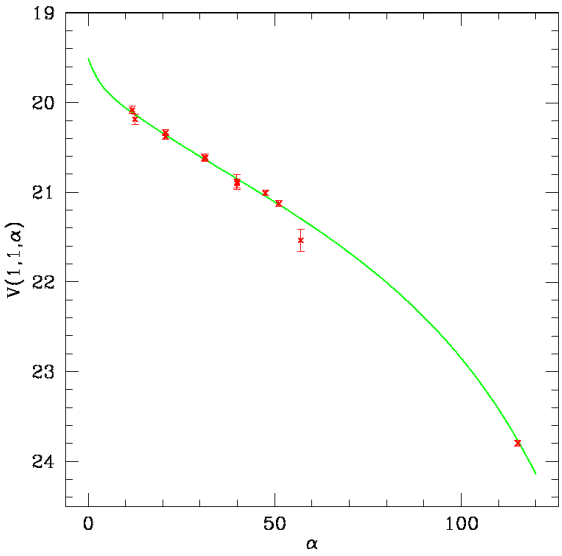
(25143) ITOKAWA ABSOLUTE MAGNITUDE AND SLOPE PARAMETER *G* CALIBRATION. F. Bernardi[1], D. J. Tholen[1] and M. Micheli[1], [1]Institute for Astronomy – University of Hawaii, 2680 Woodlawn Dr., Hawaii 96822-1897, USA, bernardi@ifa.hawaii.edu .

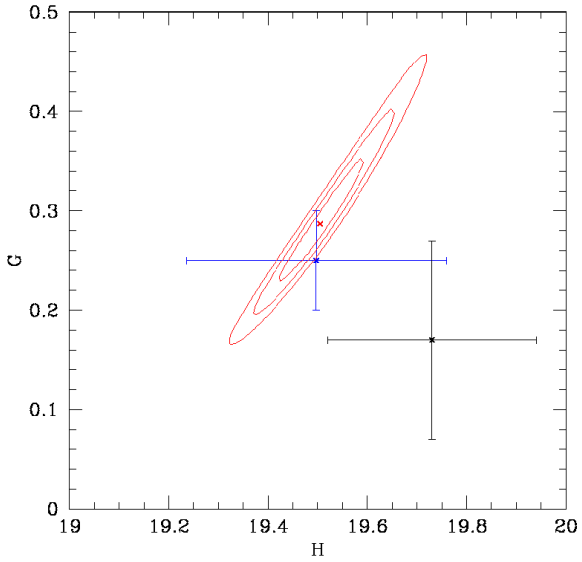
Introduction: We present results from an observing campaign of (25143) Itokawa performed with the 2.2 m telescope of the University of Hawaii between November 2000 and September 2001. The main goal of this work is to determine the absolute magnitude *H* and the slope parameter *G* of the phase function with high accuracy for use in determining the geometric albedo of Itokawa. The extensive lightcurve data can also be combined with the in situ spacecraft observations four years later in an attempt to detect the YORP effect.

Our data set: We performed 7 observing runs for a total of 12 nights, 11 of which were photometric, using the R Cousins filter or the v ECAS filter and a 2Kx2K Tektronix camera. We covered phase angles between 12.5 and 115.2 degrees with V magnitudes ranging between 14 and 21 with a typical photometric error less than 0.05 mag.



Graph 1 - Best fitting Phase Function for our data set

Data reduction and results: In order to estimate the mean V magnitude along the lightcurve for every night, we fitted our data with a synthetic lightcurve obtained by modeling Hayabusa Spacecraft observations (N. Hirata, personal communication). We assumed a V-R for Itokawa of 0.482±0.006 resulting from a weighted average of four different works in literature [1][2][3][4]. We corrected the observation times for lighttime and the photometry for distance. We computed, then, the V(1,1,α) for every night, according to the Bowell formalism [5] (graph 1). With our two parameters (H and G) best fitting technique we obtained $H = 19.51^{+0.09}_{-0.08}$ and $G = 0.29^{+0.07}_{-0.06}$, as shown in graph 2.



Graph 2 - *H* and *G* uncertainty region for our data (red, 1-2-3 sigma levels) and values from Abe [1] (black) and Nishihara [4] (blue)

Assuming an average diameter d = 0.332 km from Demura [6] and using the formalism of Bowel [5], we obtain a geometric albedo $P_H = 0.260^{+0.021}_{-0.020}$, a phase integral $q = 0.49^{+0.05}_{-0.04}$ and a Bond albedo of $A = 0.126^{+0.016}_{-0.014}$.

Our results agree with other works in literature within the errors, but we can better estimate the uncertainty in the (*H*,*G*) plane, because these two physical parameters are strongly correlated.

References:

[1] Abe M. et al. (2002) *LPS XXXIII, Abstract #1666.* [2] Lederer S. M. et al .(2005) *Icarus, 173, 153–165.* [3] Lowry S. C. et al .(2005) *Icarus, 176, 408–417.* [4] Nishihara S. et al. (2005) *LPS XXXVI, Abstract #1833.* [5] Bowell et al. (1989) *Asteroid II, 524.* [6] Demura H. et al. (2006) *LPS XXXVII, Abstract #1716D.*