Physical properties of small B-type asteroids from SDSS and WISE data

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In this work, we study the physical properties from WISE data (Wright et al. 2010, Mainzer et al. 2011, Masiero et al. 2011) of a list of asteroids whose Sloan Digital Sky Survey (SDSS) data are compatible with those of B types in terms of their negative visible slopes (see, for example, de Leon et al. 2012). This allows us to extend to smaller-sized objects the study of spectroscopic B-types carried out by Ali-Lagoa et al. (2013), where we concluded that the members of the Pallas collisional family (PCF) have significantly different geometric albedos than the rest of the B types.

Grav et al. (2012) pointed out that, even though the small-end members of the Jupiter Trojans appear to have higher geometric visible albedos than their larger counterparts (see their Figure 3), this is actually an artifact caused by the natural spread of the errors of the smaller objects and that there is no strong trend between size and albedo for the Jupiter Trojans. This motivates us to examine — in a different context, since we are not proposing an albedo-size dependency — the possibility that the abovementioned difference between the PCF and the rest of spectroscopic B types may also be caused by the former being smaller than the latter, which would introduce potential biases and/or result from larger relative errors in the values of the geometric albedo, since it is derived from poorer-quality asteroid absolute magnitudes and best-fit radiometric diameters.

References: Ali-Lagoa, V., de Leon, J., Licandro, J., et al. 2013, A&A, 554, A71; de Leon, J., Pinilla-Alonso, N., Campins, H., Licandro, J., & Marzo, G. A. 2012, Icarus, 218, 196; Grav, T., Mainzer, A. K., Bauer, J. M., et al. 2012, ApJ, 759, 49; Mainzer, A., Grav, T., Masiero, J., et al. 2011, ApJ, 736, 100; Masiero, J. R., Mainzer, A. K., Grav, T., et al. 2011, ApJ, 741, 68; Wright, E. L., Eisenhardt, P. R. M., Mainzer, A. K., et al. 2010, AJ, 140, 1868.