Population of refractory small meteoroids in asteroidal orbits

M. Campbell-Brown[1]

[1]University of Western Ontario

Routine meteoroid observations allow a wide variety of cometary and asteroidal material to be sampled at 1 au. CAMO (the Canadian Automated Meteor Observatory) has been routinely observing two-station meteors since 2009, and over 3500 meteors with orbits and full light curves have been collected and reduced with the image-intensified influx cameras. The influx cameras have a limiting meteor magnitude of +6 and a field of view 20 degrees across. The meteors have an average mass of about 0.1 mg, about a factor of ten smaller than standard intensified video cameras.

Compared to other meteor surveys, the CAMO influx system observes an excess of low speed (<30 km/s) and low beginning height (<100 km) meteoroids. The bright meteors observed by this system have a speed and height distribution similar to less sensitive cameras. Among the low, slow meteors is a subpopulation, consisting of about 6 % of the total number of meteors, with very low speeds and begin heights (<15 km/s, <85 km), which show rapid onset light curves. These are comparable to a sample of iron meteoroids observed by Borovička et al. (2005), and have orbits most consistent with asteroids. The meteoroids in this group are uniformly fainter than third magnitude, and therefore poorly represented in other surveys. They are also not seen in large radar surveys of meteors, likely because their slow speeds mean they produce very little ionization. Preliminary analysis of this unusual meteor population will be presented.

References: Borovicka et al. 2005, Icarus, 174, 15