

Telescopic meteors from Haleakala - preliminary results from AMOS and ATLAS

Peter Vereš, Juraj Tóth, Larry Denneau, Daniel O'Gara, Robert Jedicke, Michael Maberry and AMOS team

Meteors detected by CCD cameras on telescopes can be much fainter than those detected in all-sky video meteor cameras and allow astrometric solutions for the trajectory in order of a few arcseconds. Study of the faintest meteors allow us to determine the minimum weight and velocity of particles that are still producing a visible trail. On the other hand, a telescope has usually a small field of view and even though a meteor is coincidentally seen, its beginning and end are out of fields and its direction is impossible to determine. Therefore, search for meteors in wide-field CCD images seem to be a solution. We present preliminary results on detections of meteors in the CCD images of ATLAS-HKO simultaneously observed also by AMOS meteor system from the Haleakala Observatory. ATLAS is a wide-fields NEO survey built and operated by University of Hawaii and funded by NASA, with a field of 28.9 square degrees, 1.86" pixels and a limiting magnitude of almost +20 mag. ATLAS telescopes are located on Mauna Loa (ATLAS-MLO) and Haleakala (ATLAS-HKO) in Hawaii, separated by 147 km. Coincidentally, AMOS all-sky meteor orbit system (AMOS-HK) is installed and operating only 87 meters from ATLAS-HKO. We investigated how many meteors detected by AMOS were detected by ATLAS-HKO between October 14 and December 19, 2018. By knowing the pointings of the ATLAS-HKO and exact times of detected AMOS meteors, we found 13 common meteors, which was in accordance with the expected detection rate based on probability density distribution of meteors on the sky and ATLAS survey cadence. We will discuss further options for computing high-accuracy meteor orbits if the same ATLAS telescopic meteor was detected by AMOS stations on Mauna Kea and Haleakala and reverse search for meteors in ATLAS fields not seen in AMOS cameras, to determine AMOS detection efficiency and population of faint meteors.