

## AMOS meteor global network

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AMOS (All-sky Meteor Orbit System) is an image-intensified all-sky video meteor system originally developed for the Slovak Video Meteor Network in 2007 at the Astronomical and Geophysical Observatory in Modra (AGO) of the Comenius University (Tóth et al., 2011, Zigo et al., 2013). Currently, five stations are operational in Slovakia and two on Canary Islands since March 2015 (Tóth et al., 2015). A pair of AMOS cameras were installed in Chile in March 2016 (Tóth et al., 2016) to monitor the meteor activity on the southern sky. Another pair of AMOS cameras were installed on Hawaiian Islands: atop of Haleakala and Mauna Kea. AMOS consists of DMK digital cameras with resolution of 1600 x 1200 pixels and a frame rate of 20 fps, which corresponds to the field of view 180 x 140 degrees and limiting magnitude of +5.5 mag for stars and +4 mag for meteors and other moving targets. The outer aluminum shell has light, rain, temperature and humidity sensors that support the autonomous operation of the system.

AMOS cameras are operated continuously through the year to monitor the all-sky meteor activity at night. A single AMOS station usually detects 10 000 - 20 000 meteors per year. Depending on weather conditions and distance between the stations (in Slovakia on average 90 km, Canary Islands 147 km, Chile 83 km, Hawaii 127 km), probability of a multi-station detection of the same meteor is about 30 - 40 %. We are working on a new detection software for meteor trajectory and orbit determination based on Ceplecha et al. (1987); Borovička et al. (1995); Kornoš et al. (2015). Each AMOS station pair is also equipped with a meteor spectral narrow-field camera.

Currently, we are building AMOS systems for suitable locations in Australia, and Namibia or South Africa. Our aim is to develop a global network for a continuous monitoring of the influx of mm - m size meteoroids to the Earth and for characterization of weak meteor showers. Database of accurate meteor trajectories and orbits is under development and will be released soon. A sample of the data will be presented.

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### References

- Borovička J., Spurný P., Keclíková J. (1995). *Astron. Astrophys. Suppl. Ser.*, 112, 173–178.
- Ceplecha Z. (1987). *Bull. Astron. Inst. Czechosl.*, 38, 222–234.
- Kornoš L., Ďuriš F. and Tóth J. (2015). In Rault J.-L. and Roggemans P., editors, *Proceedings of the IMC, Mistelbach, Austria, 27-30 August 2015*. IMO, pages 101–104.
- Rudawska, R., Matlovič, P., Tóth, J., Kornoš, L. (2015). *Planetary and Space Science*, 118, 38–47.
- Tóth J., Kornoš L., Vereš, P., Šilha, J., Kalmančok, D., Zigo, P., Világi, J. (2011). *Publ. Astron. Soc. J.*, 63, 331.
- Tóth, J., Zigo, P., Kalmančok, D., Šimon, J.; Kornoš, L.; Világi, J.; Rudawska, R.; Serra-Ricart, M.; Perez, J. C.; Licandro, J. (2015). In Gyssens, M.; Roggemans, P., editors, *Proceedings of the IMC, Mistelbach, Austria, 27-30 August 2015*. IMO, 63-65.
- Tóth, J., Kaniansky, S. (2016). In *Proceedings of the IMC 2016, Egmond*, 295–296.
- Zigo P., Tóth J., Kalmančok, D. (2013). In Gyssens, M.; Roggemans, P., editors, *Proceedings of the IMC, La Palma, Canary Islands, Spain, 20-23 September 2012*. IMO, 18-20.