



EPSC Abstracts

Vol. 14, EPSC2020-341, 2020

<https://doi.org/10.5194/epsc2020-341>

Europlanet Science Congress 2020

© Author(s) 2020. This work is distributed under the Creative Commons Attribution 4.0 License.



ASMODEUS Meteor Simulation Tool

Martin Baláž¹, Juraj Tóth¹, Peter Vereš^{1,2}, and Robert Jedicke³

¹Comenius University, Department of Astronomy, Physics of the Earth and Meteorology, Slovakia (martin.balaz@fmph.uniba.sk)

²Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, USA

³University of Hawaii, Honolulu, HI, USA

We describe a universal meteor simulation tool set named ASMODEUS and present several of its possible use cases. The toolset consists of a Monte-Carlo simulator of meteoroids entering the Earth's atmosphere, functions for transformation to observer-centred coordinate frames representing virtual views of the sky, application of observational bias effects and a number of statistical tools for analyses of produced data sets and comparison to real-world data. The simulation has already been used in several areas of research, most notably estimates of meteoroid flux and de-biasing of real-world meteor observations and in investigation of how varying the initial properties of meteoroids affects the resulting meteors. It lends itself to many more possible applications, such as assessment of selection bias in ground-based observing systems, investigation of models of meteor flight and ablation, and evaluation of mass and population indices of meteor showers.