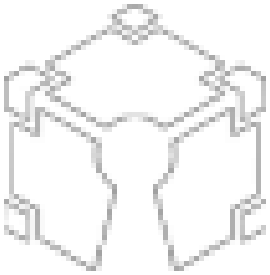

Contribution ID: **29** Type: **Poster**

Open-Source Mission Planning Tool for University Satellites

During the last decade the amount of Cube-Sats and small satellites from Universities all around the globe increased rapidly. One of these small satellite, the Flying Laptop (FLP), is operated by the Institute of Space Systems (IRS, University of Stuttgart). The operations team uses third party software besides self-written pipelines to propagate the satellite orbit. Without hosting all the source code itself it might be difficult to adjust/implement additional functionalities.

Following an internship at the European Space and Astronomy Center (ESAC/ESA) an in the context of a master thesis, a mission planning tool (MPT) was developed using the well documented open-source library SPICE, SPICE-enhanced Cosmographia by the Navigation and Ancillary Data Facility (NAIF/JPL) and the open-source General Mission Analysis Tool (GMAT/NASA Goddard) which are also used by NASA and ESA themselves. Functionalities implemented include but are not limited to: Creating a data base out of GPS or NORAD TLE and attitude telemetry for analisis purposes (SPICE), propagating orbits and attitudes for short term mission planning (up to 1 month) including pointing to self-defined targets or events (SPICE/GMAT). Visualization for most of this data is also included (Cosmographia). At this moment the MPT is aligned with some needs of the FLP operations team to serve as an addition to already existing software to provide redundant output for some usecases. One of the major advantages of this modular based code is the high adaptability to new requirements. The code for this project is open source and is available as Pyhon Package Index Package and on Git from BitBucket server.

This contribution will point out some capabilities of this mission planning tool and hopes to rise the interest of others to develop this project further. The ultimate goal is a reliable open-source mission planning tool which could be adjusted to any mission within hours and maybe even setting a standard for mission planning tools among universities.

Primary authors: Mr GRASS, Markus (University of Stuttgart); COSTA SITJÀ, Marc (RHEA System for European Space Agency); Dr KEIM, Jonas (University of Stuttgart)

Presenter: Mr GRASS, Markus (University of Stuttgart)

Session Classification: Posters and Demos

Track Classification: Space Science Data and Software