

## **Scilab Application for Space Exploration Mission (MASCOT) Operations**

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The purpose of the Japan Aerospace Exploration Agency (JAXA) mission Hayabusa2 is the exploration of the near Earth asteroid 162173, also called Ryugu. Launched in December 2014, the space probe Hayabusa2 arrived in the vicinity of the asteroid Ryugu at the end of June 2018.

The Mobile Asteroid Surface SCOuT (MASCOT) was developed by the German aerospace centre (DLR) and the French space agency (CNES). The shoe-box sized lander of 10 kg hosts 4 scientific instruments dedicated to the analysis of Ryugu.

The CNES Flight Dynamics (FD) Team was responsible for performing all analyses and computations related to the trajectories of MASCOT, from release to first settlement on the surface, including bounces.

Scilab was used for various operational activities by the CNES FD team: asteroid model comparison, descent trajectory computation and visualization, radio frequency visibility, among other aspects.

Dedicated libraries have been developed. The framework called AMS already used for mission analyses at CNES was also adapted to meet the specific needs of the MASCOT mission.

The presentation will show in detail how Scilab was used. Various illustrations including operational results will also be shown.