

SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
“Hands-On” Space Education (1)

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ESMO FUNCTIONAL ENGINEERING SIMULATOR

Abstract

The ESA Education Office is carrying out several hands-on projects in order to give young scientist, engineers and students the possibility of entering in contact with all aspects of a space program in a international cooperating environment with the support of experts. The European Student Moon Orbiter (ESMO) is one of this projects and it is intended to be the first European student mission to the Moon. At this moment it is in the phase B1, one of whose main goals is the development of a simulator to support the ESMO system functional design validation, which can be split into the following tasks:

- Support the system requirements consolidation.
- Validate the key algorithms needed in the system.
- Trade-off between different design alternatives.
- Verify system preliminary and detailed design.

This kind of simulator is called Functional Engineering Simulator and it is being performed by most of the teams involved in the ESMO mission (AOCS, Flight Dynamics, OBDH, Power Management Subsystem, COMM, Payloads, Ground Segment, Propulsion teams and Structure & Configuration teams) under the coordination of the Simulations team. The simulator itself is a full project inside a greater one and in that way it has been considered. The purpose of this paper is showing the state of the art of the ESMO Functional Engineering Simulator, the way from the beginning up to now and next steps: simulator life-cycle, strategies followed, architectural concepts handled, the interfaces challenge, increasing complexity modelation and implementation, lessons learned, etc. On the other hand, working with limited-time workers or students doesn't imply to give up obtaining the desired results but yes adapting the means. The coordinating task when many of such teams from different places are involved in the same project also introduces more difficulty. Because of that, this paper offers a valuable information about how to deal with this kind of projects based on first hand experience.