Functional Simulation in Support of Model-Based System Engineering

Activity: TRP

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Abstract:

The study "FSS in MBSE" is elaborating the role of functional system simulation, in a system engineering context, supported by models. ESTEC performed various activities in order to advance the use of model in support of system engineering and verification activities. This study is in particular to combine 2 studies in this context:

- Virtual Spacecraft Design, which produced a demonstrator of an integrated systems engineering process, with effective model sharing between engineering disciplines. The current VSD use case covers phase B, where the detailed elaboration of design data is required in order to prepare the C/D activities. The primary focus of VSD was on managing design data.
- Space Simulation Reference Architecture with the objective to improve model re-use, based on a semantic refinement of the underlying SMP framework. For this the study did define a reference architecture for simulation models allowing the effective re-use of model (elements), between different benches of a mission, but also across different projects. In addition to that a data model for simulation engineering was defined, in order to ensure the information flow from simulator engineering to simulator production (facilitated through code generation), but also to prepare the integration of simulator engineering and system engineering.

With the study FSS in MBSE the integration of simulator engineering and systems engineering are in the focus. This requires the integration and alignment of the different data models: the ECSS-TM-10-23 data model, evolved in the frame of VSD, and the SSRA data model. Based on this semantic alignment a coherent flow and transformation of information from system engineering to simulation engineering is possible.