Aerospace engineers use specific tools to create simulation models and control algorithms. To test these models and algorithms with hardware-in-the-loop they must be simulated in a real-time simulation environment. Furthermore, for portability and reuse, simulation models must often comply with a simulation standard, e.g. SMP2 (Simulation Model Portability) or ECSS E-40-07. In order to reduce development costs and time it is widely acknowledged that automated transfer from modelling tools to real-time simulation environments and simulation standards is essential.
Product
MOSAIC facilitates automatic model transfer from MATLAB, EcosimPro and 20-sim to native EuroSim and SMP2 compliant simulation environments. MOSAIC Release 10 takes as input model code that has been generated by MATLAB/Simulink R2014a, EcosimPro 4.8 or 20-sim 4.1. The tool produces model source code in a format suitable for subsequent processing into a target simulation environment or interface standard. In doing so, MOSAIC will either generate model source code that can run with native EuroSim (i.e., including API information, and EuroSim specific files) or with SMP2 compliant simulation environments (e.g. EuroSim Mk5.2, SIMSAT4.3, Basiles). In the case of SMP2 the SimVis concurrent engineering environment is supported for use with SIMSAT4.3. MOSAIC can generate SMP2 compliant code (including e.g. catalogue, C++ wrapper, assembly and schedule files).

Features
- Automatic model conversion from MATLAB, EcosimPro or 20-sim to SMP2 compliant simulation environments (Basiles, EuroSim, SimVis/SIMSAT) or native EuroSim.
- End-to-end support by fully automated transfer process.
- Conversion of multiple models in one step
- User Manual explains in detail the preparation of the simulation model transfer process in MATLAB, EcosimPro or 20-sim, the actual model transfer process, and suggestions for further model customisation in EuroSim and with the SMP2 standard. In particular, SMP2/SimVis model integration is described.

Availability
- MOSAIC runs on Linux and Windows systems and is executable from a Graphical User Interface. MOSAIC is a licensed product. Licenses are free of charge in ESA member states. For information, contact mosaic@nlr.nl

Application
MOSAIC has been used in the European space industry for more than 15 years in a large number of projects. At NLR MOSAIC has been used with the flight simulators, research aircraft and spacecraft avionics projects.

The design is based on the philosophy that model changes, model decomposition and model segmentation should be done in the originating design environment. The tool treats the model as a black-box and adds interfacing code to it. It does not in any way affect the mathematical logic of a model.

"AUTOMATIC MODEL TRANSFER REDUCES COST, TIME AND EFFORT"