

SERESSA 2022

Radiation Hardening by Software: Advanced FDIR and Redundancy Concepts with COTS in Space

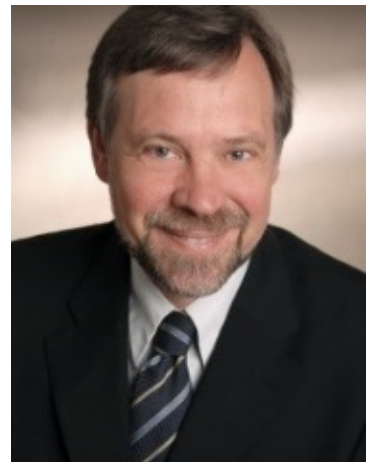
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Abstract:

Redundancy concepts in combination with advanced Fault Detection, Identification and Recovery (FDIR) software is a promising approach for improving reliability in spacecraft hardware. In the CubeSat mission UWE-3 this concept provided seamless operations for 6.5 years, despite only commercial off-the-shelf components were employed. UWE-3 on its polar LEO encountered significant SEU but due to internal redundancy switching from of the OBDH operations always continued without any interruption.

Short Bio:

Prof. Dr. Schilling had in space industry responsibility for Earth observation and interplanetary satellites (such as HUYGENS, ROSETTA), before he became chair for Robotics at University Würzburg. He is president of the research company „Center for Telematics (ZfT)“. His team built the first German pico-satellite UWE-1 for Internet in Space, launched 2005. He published more than 400 papers and received several awards, including 2021 the Eugen-Sänger-Medal from DGLR, 2012 the ERC Advanced Grant NetSat, and 2018 the ERC Synergy Grant “CloudCT” on formations of small satellites. He is member of the International Academy of Astronautics and was Consulting Professor at Stanford University.



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