

SOCRATES: a Radiation-Tolerant SoC Generator Framework

Wednesday, 22 May 2024 12:29 (1 minute)

As front-end ASIC complexity in HEP experiments grows, there is a shift towards more modular, programmable, and cost-effective designs. This work introduces the SOCRATES platform, a radiation-tolerant SoC generator toolset, centered on SoCMake, a hardware/software build system that automates SoC assembly and verification. Utilizing existing IP blocks, SoCMake generates the interconnects and the software framework to run application code. The platform includes radiation-tolerant IPs and supports fault-tolerant extensions for redundancy and error correction. A prototype ASIC based on the RISC-V Ibex processor, created using SOCRATES in a 28nm CMOS process, validates the toolset through SEE and TID testing.

Primary authors: ANDORNO, Marco (CERN); CARATELLI, Alessandro (CERN); CERESA, Davide (CERN); DENKINGER, Benoit; KLOUKINAS, Kostas (CERN); NOOKALA, Anvesh (EP-ESE-ME); PEJASINOVIC, Risto (University of Novi Sad (RS))

Presenters: ANDORNO, Marco (CERN); CARATELLI, Alessandro (CERN); DENKINGER, Benoit; NOOKALA, Anvesh (EP-ESE-ME)

Session Classification: Poster Session & Lunch