

## The AMAC ASIC for the ATLAS ITk silicon strip detector: design and verification

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A new silicon-strip charged-particle tracking detector (ITk strips) is a major component of the future upgrade of the ATLAS experiment for the high-luminosity LHC. The Autonomous Monitoring and Control (AMAC) chip is an application-specific integrated circuit designed to monitor voltages, currents and temperatures on each ITk module, and to control power to the front-end electronics. The ASIC design has been tested by both simulation and in-situ testing of prototype chips. The high fluence of charged particles moving through the read-out electronics during operation in the HL-LHC presents a set of inevitable radiation hazards. Python-interfaced simulation sequences were developed to challenge the chip's response to both single-event upsets (SEU) and single-event transients (SET). I will present how we use the simulation framework to verify that the AMAC performs its required functions and to study the response to single-event errors. I will also show the results from probing prototype chips and describe the database used to store this information.

### Are you are a member of the APS Division of Particles and Fields?

No

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