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TID Mechanisms in Nanometer-Scale Microelectronic Technologies

Monday 5 December 2022 13:30 (50 minutes)

Ionizing radiation may affect the reliability of the electronic devices, inducing a variation of their nominal electrical characteristics and degrading their performance. The lecture focuses on the dissection of TID mechanisms based on the evaluation of measurable effects affecting the electrical response of transistors. Technologies dedicated to high-energy-physics experiments have been tested at ultra-high doses, never explored thus far. Different approaches, as charge pumping, low frequency noise and technology computer-aided design simulations allow to identify the location, density and energy levels of the defects, whose investigation is essential for proposing solutions to improve their TID tolerance. The evolution of fabrication processes in the semiconductor industry leads to an unpredictable trend in TID effects, requiring continuous efforts for testing and qualifications of electronics.

Presenter: BONALDO, Stefano (University of Padova)