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Accelerator Radiation Environment and Neutron Effects in Electronics

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Abstract:

The talk introduces the radiation environment in the Large Hadron Collider (LHC) accelerator at CERN and the radiation-induced effects in electronics, presenting several comparisons with the atmospheric environment. The talk shows how the radiation levels are measured and simulated in critical areas, focusing on thermal and higher energy neutrons, which are the main contributors to SEEs. In addition, the SEEs induced by neutrons between 0.1 and 10 MeV are compared to the overall error rate due to the full neutron spectra, showing that in some cases they can induce more failures than more energetic neutrons. The related Radiation hardness Assurance (RHA) implications are presented.

Short Bio:

Matteo Cecchetto received the Master degree in Electronic Engineering from the University of Padova (Italy) in 2017, and performed the PhD at CERN (Switzerland) obtaining the degree from the University of Montpellier (France) in 2021. He is currently Senior Fellow at CERN, working in the Radiation to Electronics (R2E) project. His main activities focus on the experimental and simulation study of neutron-induced Single Event Effects in accelerator and atmospheric environments, with a deepening on the effect of thermal and intermediate-energy neutrons, and related implications on the qualification approach for electronics.



Organizers:

