

Hadron and heavy-ion accelerators/colliders - Lessons Learnt on Electronics from Accelerator Facilities

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During the first years of operation of the Large Hadron Collider (LHC) at CERN (2010-2012), Single Event Effects in electronics was the first cause of accelerator downtime, resulting in an important limitation of the particle physics production of the infrastructure. In order to alleviate this important bottleneck to a successful accelerator exploitation, mitigation measures had to be implemented, mainly consisting in shielding and relocation activities, relying on the assessment of the radiation levels in the various accelerator areas in combination with the sensitivity of the exposed equipment. These mitigation measures, mostly completed during Long Shutdown 1 (LS1) were then followed by preventive measures consisting in radiation tolerant design and qualification of accelerator systems based on COTS components, needed in order to comply with the HL-LHC availability requirements.

Presenter: GARCIA ALIA, Ruben (CERN)