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Irradiation test on the nSYNC ASIC using X-Ray and protons beam

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The nSYNC is a radiation tolerant custom ASIC, developed in UMC 130 nm technology for the readout electronics upgrade of the LHCb Muon System. The chip will be exposed, over ten years of operation, to a total dose of 130 Gy and fluence of $2 \cdot 10^{12} \text{ cm}^{-2}$ 1MeV neutrons equivalent. We present the results of radiation tests performed at the Catana facility (INFN, LNS) with 60 MeV protons beam, up to 1200 Gy, and at Cagliari X-Ray facility, with a particular focus on logic functionalities, TDC performance, measurements of Single Event effects and Total Ionizing Dose effects.

Summary

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