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Fast opamp-based preamplifier and shaping filter for smart rad-hard fast detection systems

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Different application fields require the development of fast preamplifiers and shaping filters to be coupled with dedicated radiation detectors. In view of fast prototyping and targeting a medium number of readout channels, we present in this paper the feasibility study, design and qualification of a fast, opamp-based, preamplifier and shaping filter suited to equip a smart rad-hard detection system for the diagnostics and tagging of Radioactive Ion Beams (RIBs) at high intensity (10^6 pps or higher) The paper illustrates the conception and design of the fast readout system and presents the detailed analysis and qualification of its performance in view of the design of a network of smart sensors, equipped with optimized frontend electronics, DAQ with Data Real-Time Management capabilities and a dedicated software layer implementing Artificial Intelligence and machine learning techniques as a tool to improve the production, transport and use of RIBs.

Minioral

Yes

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Yes

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Authors: CASTOLDI, Andrea (Politecnico di Milano & INFN); GUAZZONI, Chiara (Politecnico di Milano & INFN); Mr NAGGI, Andrea (Politecnico di Milano & INFN)

Presenter: GUAZZONI, Chiara (Politecnico di Milano & INFN)

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