WaveCatcher and SAMPIC International Workshop



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WaveCatcher based machine protection tools for the commissioning of the ELI-NP gamma beam system

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The new Gamma Beam System (GBS), within the ELI-NP project, under installation in Magurele (RO) by INFN, as part of EuroGammaS consortium, can provide gamma rays that open new possibilities for nuclear photonics and nuclear physics.

ELI-GBS gamma rays are produced by Compton back-scattering to get monochromaticity (0.1% bandwidth), high flux (1013 photon/s the highest in the world), tunable directions and energies up to 19 MeV. Such gamma beam is obtained when a high-intensity laser collides a high-brightness electron beam with energies up to 720 MeV with a repetition rate of 100 Hz in multi-bunch mode with trains of 32 bunches.

In this work, I will present safety tools, based on WaveCatcher digitizers, which have been developed as part of the Machine Protection System (MPS) for the commissioning of the accelerator.

A WaveForm Mask real-time interlock system has been developed in order to acquire, through an 8ch Wave-Catcher, RF reflected signals from the 13 RF sources to detect breakdown events during the conditioning and commissioning of accelerating structures. A distributed Cherenkov fiber Beam Loss Position Monitor (BLPM), acquired through solid-state detectors, involves two 8ch WaveCatchers to compute time-of-flight of Chrenkov photons and localize the electron beam losses along the whole

A new LabView driver for WaveCatchers were implemented to process waveform data and communicate with EPICS channel access.

Auteur principal: PIOLI, Stefano (INFN / Frascati)

Orateur: PIOLI, Stefano (INFN / Frascati)
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