



ID de Contribution: 20

Type: Non spécifié

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

*jeudi 8 février 2018 10:15 (25 minutes)*

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 WaveCatcher, 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 Cherenkov photons and localize the electron beam losses along the whole accelerator.

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

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**Classification de Session:** Session 5