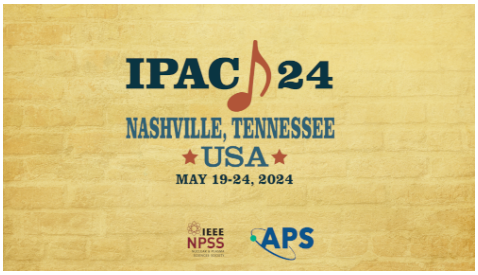

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The high level software of the beam position limits detector system for APS upgrade accelerator storage ring

Thursday, 23 May 2024 16:00 (2 hours)

A new Machine Protection System (MPS) and the Beam Position Limits Detector (BPLD) system are being developed for APS Upgrade (APS-U) accelerator storage ring. The MPS/BPLD system consists of one main MPS and 20 local MPS/BPLD controllers distributed around the ring, each local controller is located on every odd double sector. Each LMPS handles one double sector. Each double sector can be equipped up to seven Libera BPM electronics units. Each Libera unit processes up to four BPMs at Turn-by-Turn (TbT) rate. The Beam Position Limits Detector (BPLD) provides two types of protections: BPLD-ID and BPLD-BM for insertion device (ID) front-end (FE) and bending magnet (BM) incident radiation protection respectively. We select bumps using orbit feedback in a machine simulation to test the position limits of the system consistent with accelerator physics requirements for stable beam. This paper introduces the high level software implementation of APS-U BPLD-ID and BPLD-BM validation.

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