

Status Update on MicroTCA based Fast Orbit Feedback System for PETRA IV

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PETRA IV is the upcoming fourth generation 6 GeV low-emittance light source at DESY Hamburg. Two beam feedback systems are currently being developed. The multi-bunch feedback system (MBFB), which minimizes bunch instability, is based on an RFSoc design with newly developed hardware. The first board designs and the local MBFB scheme are presented. The Fast Orbit Feedback System (FOFB) for PETRA IV will be a large multi-input multi-output (MIMO) control system in an extended star topology. The layout is optimised to reduce latency between the 790 beam position monitors (BPM) and the 560 fast correction magnets. The FOFB system is mainly based on MicroTCA technology. The high-speed data transfer and distributed signal processing for the centralised control scheme will be implemented on over 500 Advanced Mezzanine Cards (AMC) in approximately 100 MicroTCA crates. The corrector strength for the feedback is calculated centrally based on the global BPM data. We present the orbit feedback topology, the modelling of the individual subsystems and their interaction in the overall feedback scheme.

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