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Recent progress on the development of the fast orbit feedback for PETRA IV

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A fast orbit feedback (FOFB) system is under development for the upcoming PETRA IV ring at DESY, Hamburg, Germany. PETRA IV shall be a fourth-generation state-of-the-art light source with stringent requirements of electron beam stability at the insertion devices in order to achieve a diffraction-limited photon beam quality of 1 Angstrom. The proposed topology and the FOFB subsystem modeling and design considerations are discussed. They include e.g. vacuum chamber, corrector magnets and power supply parameters. The closed-loop SISO (single-input-single-output) simulations are also presented for a target of 1 kHz cross-over frequency for disturbance rejection.

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