

# Realization of fast closed orbit feedback system for SIS18 synchrotron

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A fast and robust closed orbit feedback (COFB) system is realized at SIS18 synchrotron of GSI for the orbit correction during the acceleration cycles. ORM variation over the fast ramps due to the triplet-to-doublet quadrupole transition from injection to extraction posed a unique challenge for the stability of the feedback system. The theoretical investigations are presented made using control theory for the performance and stability of the COFB system in the presence of the ORM model mismatch between the controller and the system. System identification for the frequency response of the steerer magnets as well as a full-loop measurement is also presented. COFB hardware is described along with the successful demonstration of the orbit correction during the ramp at SIS18 for variable machine settings.

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