



Commissioning of Bunch-by-bunch Feedback System for NSLS2 Storage Ring

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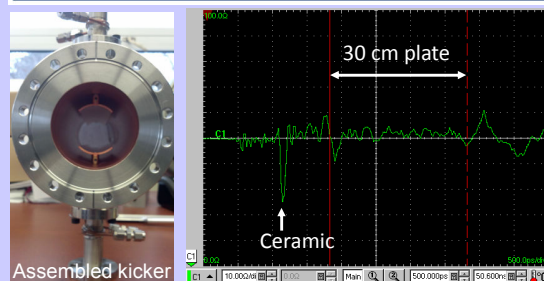
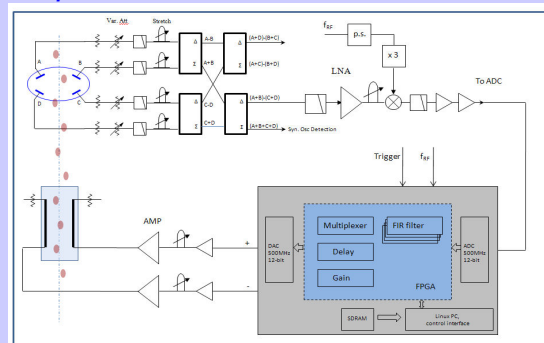
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Abstract

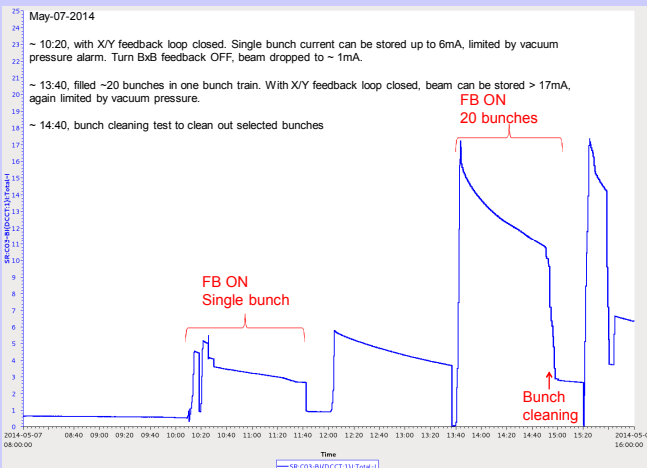
Transverse bunch by bunch feedback system has been designed to cure the coupled bunch instabilities, caused by HOM, resistive wall or ions. The system has been constructed, tested and commissioned with beam. Preliminary studies show that the feedback system can suppress single bunch instability as well as coupled bunch instabilities. Mode analysis of the unstable coupled bunch motion reveals fast ion instability exist even at relative low current.

Components

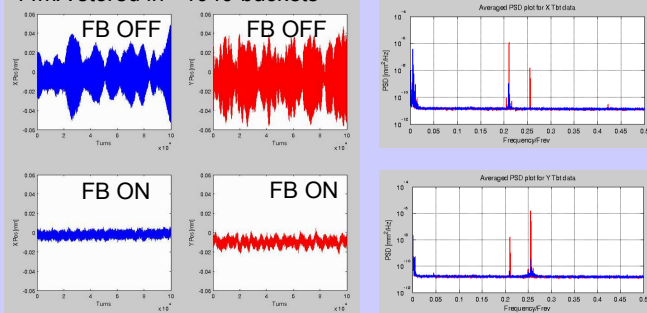


Network analyzer measured amplitude and phase response, including high power amplifier, stripline kicker, Helix cables and attenuator

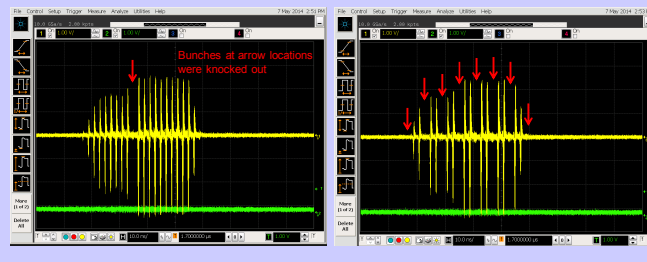
Cure instabilities



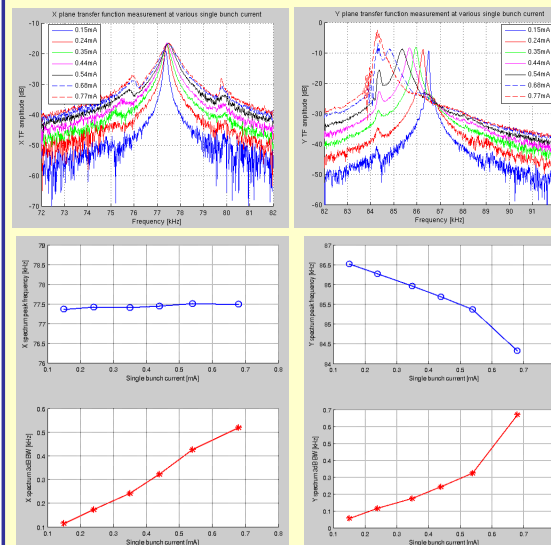
44mA stored in ~1040 buckets



(Left) BPM X/Y TbT data from one of the storage ring BPM C30BPM1; (Right) BPM TbT data spectrum averaged from 180 BPMs, red traces were spectrum with bunch-by-bunch feedback OFF and blue traces with feedback ON



Transfer function measurement



Ion effect

