

Subject: IOTA Instability Study

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Hello,

Sorry for getting this in last minute. We would like to do some anti-damper measurements in the remaining run time if possible. Below is a quick description of the proposed measurements.

Regards,
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Proposal to measure instability thresholds and growth rates using the transverse anti-damper system. Preliminary data was taken last run to demonstrate improved instability threshold with the octupole string enabled. For this run, we would like to study growth rates in more detail and if possible study the effect of the non-linear magnet as well. The system can now be setup simply by replacing the transition module for BPM E2L in ESB and BPM E2L can be returned to normal operation following the study. Further, we have implemented a method to trigger the BPM system when we change the feedback gain so we can capture TBT data for all bpms to study the instabilities. For the study, I would like to request 2 four hour shifts. The plan –

Shift 1 – 4 hours

- Commission the anti-damper (expect shift from RF change to be almost negligible)
 - Replace E2L TM
 - Bring up system on check timing on kicker Fanback
 - Make beam transfer function measurement to insure phase
- Test out new DAQ matlab scripts
 - New scripts to step gain, collect TBT & machine data
- Take preliminary data with octopoles and NL magnet
 - Step anti-damper gain, and collect TBT data for various currents and settings

Shift 2 – 4 hours (1-2 days after Shift 1 so data can be analyzed)

- Repeat more focused data measurements based upon findings from shift 1