CesrTA Machine Studies Task Overview

I. Experiment Description

Experimental Topic	BPM tilt calibrations	
Classification[*]	LET	
Coordinator/ Experimenters	JSh	JSh
Primary Goals	Calibrate BPM tilts using two methods. Also measure zero-corrector optics for validation	
Description[†]	The following should be done in multiple sets of conditions, ideally at different energies. Repeat for both positrons and electrons. 1) BPM tilt studies: 1. In each set of conditions, time in BPMs and correct optics (orbit, phase/coupling). 2. Re-time BPMs and acquire phase/coupling data in well-corrected optics. Acquire three measurements back-to-back, then re-time BPMs and repeat, to determine the effects of BPM timing on the stability of Cbar22/11 data. 3. For a subset of BPMs, use a horizontal closed bump to perturb the orbit in a known fashion, and observe the change in vertical orbit at the BPM. This vertical perturbation should be due to the BPM's tilt, assuming there are no sources of coupling within the bump itself. Choose BPMs where the surveyed quad tilt is small, and the quad-to-BPM offset is relatively small. 4. For completeness, also acquire a 300k-turn TBT BPM data set in each set of well-corrected conditions. Make sure this is with all BPMs enabled (including drift triplet) 2) Zero-corrector studies: 1. Re-time BPMs. Document the existing well-corrected conditions (orbit, phase/coupling, dispersion [AC+DC] 2. For each of the following, cumulatively, node off and disable, then time in BPMs and remeasure orbit, phase/coupling and dispersion (AC and DC): i. Skew quadrupoles ii. Vertical steerings iii. Horizontal steerings (if possible) iv. Sextupoles (if possible)	
Special Needs/Requests	Machine recovery at 1.8/2.1/2.3GeV, 4GeV (if applicable)	

[*] Machine Studies Classifications:
- EC – Electron Cloud
- LET – Optics Correction and Low Emittance Tuning
- IBS – Intra-beam scattering studies
- xBSM – x-ray Beam Size Monitor
- INST – Instrumentation (BPM development, RFA development, other)
- MDEV – Machine Development (includes injection configuration, injection tuning, custom orbit setup, instrumentation preparation, etc.)
- MREC – Machine Startup (recovering conditions after down period or access)

[†] Attach additional pages for experimental description if needed

Prerequisites[‡]	**Personnel**	**Description**
Machine recovery	MJF et al.	Machine recovery at each energy of interest (both e+/e-)
Time Requested[§]	**No. Shifts**	**Principal Tasks**
3-4x3hr	3-4	Tasks outlined above, at 1.8/2.1/2.3GeV, 4GeV (if applicable)

[‡] Indicate other machine work that is required in preparation for this machine studies experiment.
[§] Indicate the principal shift topics and estimated number of shifts required

II. Machine Studies Assignments

Reserved for Project Management Team Use		
Topic ID		
Priority[**]		
Shift Assignments	**Date**	**Shift**

[**] Priority Scale:

1. Critical – results are necessary for preparation for subsequent down/run periods
2. Very high – results are strongly desired for achieving program milestones or in preparation for subsequent down/run periods
3. High – results are of immediate interest but not require
4. Moderate – results should be pursued at the first convenient opportunity
5. Low – results are not presently a high priority for either project milestones or planning