CESR TA Machine Studies Task Overview

I. Experiment Description

Experimental Topic	Electron Cloud Instability & Damping Studies		
Classification [*]	EC		
Coordinator/	Billing/Dugan	Billing, Dugan, Sonnad, Ramirez, Palmer,	
Experimenters		Williams, Forster	
Primary Goals	Measure & document parameters associated with beam instabilities with trains of bunches		

Description [†]	Setup			
_	1. Take reference measurement			
	 a. 30 bunch train 14 nsec spacing 0.75 mA/b Instability/Damping Measurements (INST/DAMP) 			
	2. Reference Study Head-tail Damping (DAMP)			
	a. Conditions			
	i. 2 GeV lowest emittance (Big D)			
	ii. Single bunch			
	iii. Current per bunch			
	1. 0.75 mA/b			
	iv. Positrons/Electrons			
	v. Different Tunes for bunch 1			
	1. $fh/fv = 222.5/238.5 \text{ kHz}$			
	vi. Low Feedback			
	vii. Damping of m=0, +/-1 modes			
	b. Combination of a few Dimtel Feedback System			
	gain commands			
	c. Combination of a few Q'v commands			
	3. Study σ_v variation via xBSM vs. BPM head-tail line			
	signals while varying V Shaker & Long Shaking			
Special				
Needs/Requests				
Prerequisites [‡]	Personnel Description			

* Machine Studies Classifications:

- EC Electron Cloud
- LET Optics Correction and Low Emittance Tuning
- 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 time)
- [†] Attach additional pages for experimental description if needed

[‡] Indicate other machine work that is required in preparation for this machine studies experiment.

	Billing, Forster,	Establish stored beams	
	Ramirez, Billing, Sikora	Software testing of 1. Swept frequency shaking (TUNE) 2. Instability spectra (INST) 3. Damping measurements (DAMP)	
Time Requested [§]	No. Shifts	Principal Tasks	
1 hours		Measurement setup – Damping 1.	
3 hours		Measurement of damping rates vs Fdbk 2.b	
2 hours		Measurement of damping rates vs Q'v 2.c	
3 hours		BPM signal vs xBSM signal 3.	

II. Machine Studies Assignments

Reserved for Project Management Team Use				
Topic ID				
Priority ^{**}				
Shift Assignments	Date	Shift		

Notes:

1. Critical – results are necessary for 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

[§] Indicate the principal shift topics and estimated number of shifts required ^{**} Priority Scale:

^{2.} Very high – results are strongly desired for achieving program milestones or in preparation for subsequent down/run periods