## **CESR TA Machine Studies Task Overview**

## I. Experiment Description

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<b>Experimental Topic</b>	Electron Cloud Instability Studies		
Classification <sup>*</sup>	EC		
Coordinator/	Billing/Dugan	Billing, Dugan, Sonnad, Ramirez, Forster	
Experimenters			
Primary Goals	Measure beam instabilities with trains of bunches and associated tune shifts of bunches within trains of bunches		

<b>Description</b> <sup>†</sup>	Setup	Setup		
- ·····	1. Take reference measurement			
	a. 30 bunch positron train 14 nsec spacing 0.75 mA/b			
	a. 56 bullen position train 14 iisee spacing 0.75 iii/4/0			
	Instability/Damping Measurements (INST/DAMP)			
	<ul><li>2. Study Head-tail instability (INST)</li><li>a. Conditions</li></ul>			
	i.	2 GeV lowest emittance (Big D)		
		30 & 45 bunches		
	iii.	Current per bunch		
		1. 0.75 mA/b		
	iv.	Electrons (follow up for Positron		
		measurements from April 2012)		
	V.	Different Tunes for bunch 1		
		1. $fh/fv = 222.5/238.5 \text{ kHz}$		
	vi.	Concurrent xBSM bunch-by-bunch data		
		Low Feedback		
	viii.	4, 8, 12, 14, 16, 20, 24, 28 ns		
		200 kHz wide spectra		
		ent Q' (3 values)		
Special				
Needs/Requests				
Prerequisites <sup>‡</sup>	Personnel	Description		
	Billing, Forster,	Establish stored beams		

\* 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)
- <sup>†</sup> Attach additional pages for experimental description if needed

<sup>‡</sup> Indicate other machine work that is required in preparation for this machine studies experiment.

	Ramirez,	Software testing of	
	Billing,	<ol> <li>Swept frequency shaking (TUNE)</li> <li>Instability spectra (INST)</li> </ol>	
	Sikora		
		3. Damping measurements (DAMP)	
	Rider, et al	Establish xBSM detectors (positron for 1.a.)	
		& (electron for 2.b.)	
	Shanks, et al	Low emittance set up before shift $(1/2)$	
		hour?)	
	Rider, et al	xBSM set up for each shift (1 hour?)	
0			
Time Requested <sup>§</sup>	No. Shifts	Principal Tasks	
2-3 (1 hour blocks)		Measurement setup for train-head tail	
		instabilities 1.a.	
8*3*(3/4) = 3*6 hours	3	Measurement of train-head tail instabilities	
(at least)		2.b.	

## II. Machine Studies Assignments

Reserved for Project Management Team Use				
Topic ID				
Priority <sup>**</sup>				
Shift Assignments	Date	Shift		

## Notes:

<sup>&</sup>lt;sup>§</sup> Indicate the principal shift topics and estimated number of shifts required <sup>\*\*</sup> Priority Scala:

<sup>\*</sup> Priority Scale:

<sup>1.</sup> Critical – results are necessary for preparation for subsequent down/run periods

<sup>2.</sup> Very high – results are strongly desired for achieving program milestones or in preparation for subsequent down/run periods

<sup>3.</sup> High – results are of immediate interest but not require

<sup>4.</sup> Moderate – results should be pursued at the first convenient opportunity

<sup>5.</sup> Low – results are not presently a high priority for either project milestones or planning