



FEL TEST PLAN WORKSHEET

PROGRAM DEPUTY APPROVAL

FEL Exp Coordinator Signoff: _____ Date: _____
 PI Reviewer Signoff: _____ Date: _____
 Expiration Date (max. 90 days from approval): _____
 Presentation Required? yes no

COMPLETION INFORMATION

Completion Date: _____
 Crew Chief/PI Signoff: _____
 Comments (partial completion, etc.): _____

note: Information addressing the appropriate content of each of the following sections can be found in Section 2.0 of the Test Plan Instructions.

Test Plan Title: **First attempt to observe CSR-induced emittance growth in the arc 1: A quick measurement with nominal settings (DRAFT)**

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Date Submitted: August 1st, 1997

Revision Number: Rev. 3, (March 2nd, 1998)

Brief Purpose of Test

This test is intend to observe emittance growth due to coherent synchrotron radiation (CSR) in the arc1. For this first attempt to observe CSR induced emittance growth we will use the nominal optics setting for the injector, linac, and arc 1 previously determined. The test essentially consist in two emittance measurements: one at the decompression chicane exit (using a quad-scan method), the other in the backleg line (using a quad-scan technique in parallel with multi-profile monitor method).

Anticipated Benefits

Once all the CSR test will be completed we will have a better picture of the beam transverse phase-space quality in the backleg and therefore we will known if the solution that consists in locating the wiggler in the backleg is permissible.

Beam Conditions Required

Complete all of the following tables, entering a value or an X in the appropriate spaces:

Beam Type/Current (enter value)

Beam Type	Beam Current
Beam Off	
Pulsed (std. current = 1 μ A) ^a	OTR limited (60 pC)
CW	

a. The standard current for pulsed beam operation is 1 μ A. If your test requires pulsed beam current >1 μ A, then specify the required current and provide a brief explanation next to the specified current.

Beam Energy (select one)

Beam Off	350 keV	10 MeV	42 MeV	Energy Recovery dump
			X	

Beam Termination Point (select one)

Inj Dump	ER Dump	Straight Ahead Dump	Other (specify)
			last insertable dump in the backleg

Type of Test (select one)

Invasive (disrupts beam delivery)	Non-invasive (does not disrupt beam delivery)
X	

Time Required

1 hour for reestablishing a good nominal setup
 2 hour of stable beam to perform emittance beam
 Total needed about half a shift (4 hours)

Preferred Time of Test

None

Staff Required to Execute the Test (including contact info)

P. Piot (X/Pgr: 5032/9467), or D.Douglas (X/Pgr:7512), or R. Li (X/Pgr: 7069)

Controlled Access Requirements

None

Hardware and/or Software Changes Required

NOTE: If software changes are part of the test plan, include the name of the application, the old revision level, the new revision level, and if applicable, whether or not it is possible to roll back to the old revision level (are there hardware limitations, etc.).

None

Setup Procedure

1. This testplan assume we have achieved a good optics set-up with the wiggler removed and that the beam is well quad-centered.
2. Check that all the OTR's that are going to be use in the testplan are properly cal-

ibrated

3. Restore nominal setup for the injector/ linac (without wiggler) and arc1
4. Measure bunch charge in the wiggler insertion using the Michelson-interferometer (IHI2F05): _____mm

Test Procedure

1. Setup beam in OTR limited mode (18MHz/250 μ sec/2Hz) with a bunch per charge of (60pC) up to the straight ahead 42 MeV
2. Measure emittance before arc1:
 - a. download optics file *****
 - b. Start beast.tcl, initialize the measurement (click on Initialize), and select "Quad-Scan". Then follow the steps in the code, and chose the quad MQG2F09 and the monitor ITV2G00 to perform the measurement. Note the measured parameters:
 ϵ_x =_____; ϵ_y =_____
 β_x =_____; β_y =_____
 α_x =_____; α_y =_____
 - c. print a hardcopy of the screen
3. Turn off beam
4. download the optics file *****
5. Insert dump IDC2F06
6. Setup beam in OTR limited mode (18MHz/250 μ sec/2Hz) with a bunch per charge of (60pC) up to IDC2F06
7. Measure emittance in the backleg
 - a. Start beast.tcl, initialize the measurement (click on Initialize), and select "Wiggler-Multi-monitor". Then follow the steps in the code and note the measured parameters:
 ϵ_x =_____; ϵ_y =_____
 β_x =_____; β_y =_____
 α_x =_____; α_y =_____
 - b. print a hardcopy of the screen
8. If possible, redo step 1 to 7 several times.

Backout Procedure

1. make sure all the OTR are withdrawn
2. restore nominal optics for the whole machine

Test Results
