



TEST PLAN WORKSHEET

PROGRAM DEPUTY APPROVAL

PD Signoff: _____ Date: _____
 Ops Reviewer Signoff: _____ Date: _____
 Expiration Date (max. 90 days from approval): _____
 Presentation Required? yes no

COMPLETION INFORMATION

Completion Date: _____
 Crew Chief 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: **Adiabatic Damping and Parity Quality of Low Energy Beam for G0 Backward Angle Running**

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Revision Number: Rev. 0.1, (September 27, 2004)

Brief Purpose of Test

Determine whether it is possible to deliver parity quality beam at low energy for G0 backward angle running. Measure the adiabatic damping in the helicity correlated beam position differences between the injector and Hall C.

Anticipated Benefits

Provide early information about the quality of the beam at low energy. Find out if the expected adiabatic damping can be achieved at low energy. Measure the beam properties at low energy to see if it meets G0 requirements.

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 = 8 μ A) ^a	
CW	X

a. The standard current for pulsed beam operation is 8 μ A. If your test requires pulsed beam current >8 μ A, then specify the required current and provide a brief explanation next to the specified current.

Beam Energy (select one)

Beam Off	845 MeV (1-pass)	1.645 GeV (2-pass)	2.445 GeV (3-pass)	3.245 GeV (4-pass)	4.045 GeV (5-pass)	Other (specify)
	X				X	

Beam Termination Point (select one)

Hall A	Hall B	Hall C	BSY Dump	NE Stub Dump	45 MeV Dump	Other (specify)
		X				

Type of Test (select one)

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

Time Required

- a. 4 hours to repair the first pass RF separator.
- b. Setup Procedure: 8 hours
- c. Test Procedure: 6 hours
- d. Backout Procedure: 4 hours

Note: The test will be done in two parts. Part I should take place a few days before Part II and Part I takes only two hours to be performed.

Preferred Time of Test

Beam Studies, Fall 2004

Staff Required to Execute the Test (including contact info)

Ops, G0

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.).

First pass RF separator must be operational. The 5 MeV region BPMs: 0L02, 0L03, 0L06 are connected to rack IN03B05; these are disconnected now

Special Hazards/Safety Considerations (enter "None" if not applicable)

HAZARD (describe the specific potential hazard[s]; e.g., MPS or PSS interlocks disabled, work near energized equipment, etc.):

none

RISK (characterize the risks involved [e.g., beam damage to beamline components, electrocution of personnel by contact with magnet leads, etc.] and assess the level of risk per the *EH&S Manual, Section 3210, Hazard Identification and Characterization*):

none

CONTROLS (describe what specific measures will be used to mitigate the hazard; if the risk assessment [i.e., risk code] is ≥ 3 , list the applicable work control document [SOP, OSP or TOSP]):
none

Setup Procedure

1. First pass RF separator must be operational.
2. The position and current monitors in the injector and Hall C are operational.
3. Beam only delivered to Hall C. Beam to Hall A may dilute the injector measurements.
4. G0 PZT is operational up to its maximum deflection.
5. G0 IA is operational.
6. The 5 MeV region BPMs: 0L02, 0L03, 0L06 are connected to rack IN03B05. These are disconnected now.
7. Take an allsave and fopt.
8. Helicity pattern is Quartet.

Test Procedure

1. Hall A and Hall B need to be off during this test.
2. **Part I:** In October, as early as possible, with 5-pass beam we will measure the beam properties and the adiabatic damping. This is to establish that the hardware needed for the test is ready and the tune of the beam is optimized (the adiabatic damping is of the expected order). The PZT will be used to generate large helicity correlated position differences in the injector. These differences will be measured in Hall C. IA scan and BCM/BPM calibration will be done. The BCM/BPM calibration requires that the beam current be set to certain values (15, 30, 45, 60, 75, 80) for short periods of time. This is mainly to determine the "beam-based" pedestals for the BPMs. 2 hours of beam is needed for this part.

The Part II of the test will require a pass change from 5 to 1. This would be best to occur several days after Part I.

3. **Part II:**
 - Just before the pass change, we will measure the adiabatic damping and beam properties at 5 pass. IA scan and BCM/BPM calibration will be done. 2 hours of beam is needed.
 - Measure beam energy in Hall C at 5 pass - 2 hours.
 - Change beam delivered to Hall C from 5 pass to 1 pass. Optimize the beam to achieve parity quality beam - 6 hours.
 - Measure the beam properties and the adiabatic damping at 1 pass - 2 hours.

- Change beam delivered to Hall C from 1 to 5 pass - 2 hours.
- Measure beam energy in Hall C at 5 pass - 2 hours.

Backout Procedure

1. Restore 5 pass beam to Hall C.