

## Hall C NPS Sweeper Dipole Setup Procedure

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### Document Number:

- MCC-PR-06-??? (maybe 013?)

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- Rev. 1b4

### Release Date:

- DRAFT

### Technical Custodian:

- Lester Richardson

### Estimated Time to Perform:

- <20 minutes

### When to Use this Procedure:

- The Sweeper dipole must be configured during initial beam setup for the NPS Experiments and then after every spectrometer angle change.

## Procedure Overview

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This procedure describes how to change the Hall C Sweeper dipole setting and then adjust the beam orbit to the Hall C dump using the upstream and downstream Sweeper correctors. The dipole is ramped to the specified setpoint in discrete steps, with beam orbit correction to the dump viewer following each step.

## Prerequisites

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- 1) You have received a request from the Hall C Control Room to change the Sweeper dipole setting, and the request has been approved by the Crew Chief and at least one of the

following: Hall C Subject Matter Expert (Dave Gaskell), Hall C APEL (Jay Benesch), or Hall C Ops Liaison (Lester Richardson).

- 2) Hall C has specified the new Sweeper dipole setpoint and calculated Sweeper corrector settings (they should be in the Hall C Experiment Binder). You will need to refer to these values when executing this procedure.
- 3) SHMS should be at the angle intended for the kinematics. All of its magnets should be off.
- 4) The Hall C target is out of the beam path.
- 5) The Hall C fast raster is OFF.
- 6) The Hall C dump viewer must be functional (verified with beam later in this procedure).

## Hall C NPS Sweeper Dipole Setup Procedure Steps

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- \_\_\_ 1. Verify that all Prerequisites (above) have been met.
- \_\_\_ 2. Start a running ELog entry that includes the requested setpoint.
- \_\_\_ 3. Open the NPS Sweeper Screen (**JMenu**→**Operations**→**Magnets**→**Special Hall Magnets**).
- \_\_\_ 4. Mask the FSD trip points **Low Limit** and **High Limit** for the Sweeper magnet and each of the two correctors. Record this action in the ELog entry.
- \_\_\_ 5. Zero the setpoints for the Sweeper dipole (NPSsweep) and both Sweeper correctors (NPScorrUS & NPScorrDS).
- \_\_\_ 6. Establish 5  $\mu$ A Tune-Mode beam to the Hall C dump.
- \_\_\_ 7. Steer the Hall C line to zero ( $\pm 0.5$ mm) the absolute orbit to the Hall C dump. Steer the absolute orbit at the last two BPMs before the target (IPM3H07A & IPM3H07B) to zero ( $\pm 0.2$ mm).
- \_\_\_ 8. Is beam visible on the Hall C dump viewer?

**Yes** > Go to **Step 9**

**No** > If the beam spot is not visible on the Hall C dump viewer, terminate beam to Hall C and contact one of the following for instructions how to proceed: Hall C Subject Matter Expert (Dave Gaskell), Hall C APEL (Jay Benesch), or Hall C Ops Liaison (Lester Richardson). Do not proceed without Crew Chief approval.

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- \_\_\_\_ 9. Ensure that the beam is in the central third of the viewer in X and Y with the settings from [Step 7](#).
  - \_\_\_\_ 10. Terminate beam to Hall C.
  - \_\_\_\_ 11. Ramp the Sweeper dipole (NPSsweep) to 25% of the requested setpoint, while leaving both corrector magnets at 0A.
  - \_\_\_\_ 12. Send 5  $\mu$ A Tune-Mode beam to Hall C.
  - \_\_\_\_ 13. Ramp the Sweeper correctors (NPScorrUS & NPScorrDS) to 25% of the calculated correction value. Adjust the correctors within  $\pm 10\%$  of their set points to get the beam close to the original location.

***Is the beam in roughly the same spot on the viewer image as in [Step 9](#)?***

**Yes >** Go to [Step 14](#).

**No >** Contact one of the following for instructions how to proceed: Hall C Subject Matter Expert (Dave Gaskell), Hall C APEL (Jay Benesch), or Hall C Ops Liaison (Lester Richardson).

- \_\_\_\_ 14. Repeat [Step 10–Step 13](#), above, increasing the dipole and corrector setpoints an additional 25% each time until the Sweeper dipole has been ramped to the requested setpoint and the beam is centered on the dump viewer.
- \_\_\_\_ 15. Set the FSD trip points **Low Limit** and **High Limit** for the Sweeper dipole and both of the Sweeper correctors to  $\pm 5\%$  of their present value.
- \_\_\_\_ 16. Unmask the FSD trip points **Low Limit** and **High Limit** for the Sweeper dipole and both of the Sweeper correctors. Record this action in the ELog entry.
- \_\_\_\_ 17. Add screenshots of the dump viewer and the *NPS Sweeper Screen* to the running ELog entry and submit the entry.
- \_\_\_\_ 18. Procedure complete.