

## Performing a Total Absorption Counter (TAC) Run

### NOTE:

The following steps presume that:

- Section 1.0, page 2 of this procedure has already been completed.
- Production beam delivery to Hall D has already begun.
- The primary collimator is set to either the 3.4 or ~~5.5~~ 5 mm hole position with beam going to Hall D.

1. Verify that the beam is locked to the desired positions at >15 nA. The PID locks for IPM5C11B and the active collimator should be engaged at Hall D's desired targets. Allow the orbit to converge to Hall D's desired targets at IPM5C11B (stripline BPM) and the active collimator if necessary.

2. Turn OFF the PID orbit locks for IPM5C11B

3. Ask Hall D for their desired lock target position at IPM5C11A and input the position into the locks. Turn ON the IPM5C11A (nA BPM) PID orbit locks and allow positions to converge.

4. Cease beam delivery and close the slit. Ask Hall D to switch the active collimator gains to  $1 \times 10^{-11}$ .

5. The radiator used for the measurement will vary depending on the chopper slit configuration for Hall D with respect to the other experimental halls. Is Hall D sharing their slit with another high current (>10  $\mu$ A) hall that will be taking beam during the measurement?

Yes: Proceed to step 6 below.

No:

A. Contact Hall D and ask which radiator they would like to use for the measurement ( $10^{-4}$  or  $10^{-5}$ ;  $10^{-5}$  will provide the cleanest measurement). Ask the Crew Chief to update the ion chambers with the appropriate calibration values.

B. Go to Step 7, below.

6. Load ion chamber calibrations for the 15  $\mu$ m Al V-wire target.

7. Insert FC#1 and establish slit and attenuator settings to produce 15 nA CW beam as measured in the cup.

8. Verify with Hall D that the Total Absorption Counter (TAC) has been maneuvered into the beamline in the appropriate position.

9. CAUTION: The TAC has a maximum operating current of 50 nA CW of electron current. Verify this with the Operational Restrictions.

Establish 15 nA CW beam to the TAC using the settings established in Step 7, above.

10. Contact Hall D and ask them for the desired beam positions at IPM5C11A and the active collimator for the TAC run.

11. Contact Hall D and verify that the TAC, Compton, Calorimeter (Comcal), and Pair Spectrometer rates are acceptable (should correspond to Pair Spectrometer rates of 5–7 Hz and Comcal rates of 80–100 kHz). Adjust the slit position or attenuator setting as necessary to maintain these levels as directed by Hall D while keeping the Operational Restrictions in mind.

12. Is the 15  $\mu$ m Al V-wire target being used to perform the measurement?

A. Turn OFF the PID IPM5C11A and active collimator orbit locks as well as the Extraction D lock if it is still engaged.

B. Reduce the beam current to <5 nA, and continue to reduce it until the TAC, Pair Spectrometer, and Comcal rates are acceptable to the Hall D counting house.

C. Go to Step 14, below.

13. Reduce the beam current until the TAC, Pair Spectrometer, and Comcal rates are acceptable to the Hall D counting house.
14. During the measurement, make slit and attenuator adjustments as necessary to maintain the event rate desired by Hall D.
15. To back out of the measurement:
  - a. If engaged, turn OFF the IPM5C11A orbit lock.
  - b. Ask Hall D to adjust the Active Collimator gains to  $1 \times 10^{-9}$ . After they have completed the adjustment, raise the beam current to 15 nA and engage the PID IPM5C11B and active collimator orbit locks at their desired target positions.
16. PROCEDURE COMPLETE.