

Goals for HYCAL Survey

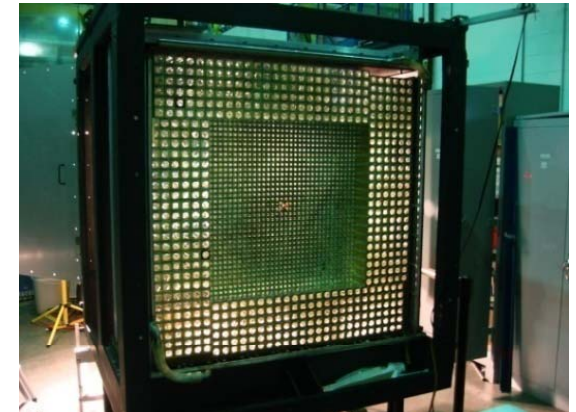
1. HYCAL internal structure survey (on Sept. 22.)
2. Calibration with HYCAL on Transporter (on Sept. 22.)
3. HYCAL on production stand Survey (about one week after Sept. 27)

1. HYCAL Internal Structure Survey

Note: keep HYCAL front face open, measure (x,y,z)

Procedure: (Precision 0.8 mm)

- 1) Move HYCAL to the nominal hycal-centered-on-beam position
- 2) Measure position of the center of circular aperture.
- 3) Measure positions of the tooling balls.
- 4) Measure roll, pitch and yaw of the HYCAL
- 5) Measure positions of 4 corners of PWO section, both on the PWO and Pb-glass surfaces
- 6) Measure positions of all corners of each Pb-glass section



2. Goals for Transporter calibration

precision of repeatability: 2 mm

- Measure the ratios of the motor reading and actual distance in both x and y directions
- Switch limit position measurements
- Calibration of the digital vs. analog reading of the transporter

Plan for Transporter calibration

Preparation:

- 1) HYCAL on the transporter
- 2) Move HYCAL to the nominal hycal-centered-on-beam position
- 3) Start data logging, make sure to record both digital and analog readings for motor, and the time of the record

Survey Points for Transporter calibration

Note: after each motion, a survey will be performed to measure (x, y, z) position of the center of circular aperture, and roll, pitch, yaw of HYCAL by using HYCAL front surface

- 1) Measure position of the center of circular aperture when HYCAL at the nominal position, and record (x, y, z) positions of all tooling balls.
- 2) Move off center in +x and return
- 3) Move off center in -x and return
- 4) Move off center in +y and return
- 5) Move off center in -y and return
- 6) Move to 2 units in -y
- 7) Move to 2 units in -y
- 8) Move to 2 units in -y
- 9) Move to 2 units in -y
- 10) Move to 2 units in -y
- 11) Move to the lower switch limit in y
- 12) Move off the lower switch limit in y and return
- 13) Move off the lower switch limit in y and return

Survey Points Continue

- 14) Move to 2 units in $-x$
- 15) Move to 2 units in $-x$
- 16) Move to 2 units in $-x$
- 17) Move to 2 units in $-x$
- 18) Move to 2 units in $-x$
- 19) Move to the lower switch limit in x
- 20) Move off the lower switch limit in x and return
- 21) Move off the lower switch limit in x and return
- 22) Move HYCAL to the center position in x
- 23) Move to higher switch limit in x
- 24) Move off the higher switch limit in x and return
- 25) Move to the center of the most bottom right Pb-glass detector
- 26) Move to the center of the most bottom right PWO detector
- 27) Move to the nominal hycal-centered-on-beam position
- 28) End data logging

3. HYCAL on production stand Survey

requested Precision: 0.8 mm

Preparation:

- 1) HYCAL is sitting on the production stand and align the HYCAL at the nominal production position with 0.8 mm precision.

Procedure:

- 1) Measure the positions (x, y, z) of all tooling balls in the Hall B coordinate system. Determine the position of the center of circular aperture of the HYCAL.
- 2) Measure roll, pitch, yaw of the HYCAL in the Hall B coordinate system