



# Jefferson Lab Alignment Group

## Data Transmittal

**TO:** B. Sawatzky, M.Long

**DATE:** 16 Feb 2017

**FROM:** Chris Gould

**Checked:**

**# :** C1771

**DETAILS:**

M:\align\DATA\Step2B\HALLC\SHMS\HUT\_DETECTORS\170214A

Below are the results of the recent SHMS Wire Detector alignment. Two coordinates systems are given, Ideal and Beam Following. The Ideal system defines the Z axis by constructing a line through the ideal locations of Q1, Q2 and Q3 and places the Z origin at the target. The Beam Following system places the XYZ origin at the ideal location of each wire detector and rotates the system about the X axis -18.4 degrees. A + X is beam left, a +Y is up and a +Z is downstream. Right hand rule applies.

It should be noted that the ~6.5mm offset in Z was intentionally made to avoid possible interferences with the upper PMT tubes when translating the detectors out of beam.

The Gas Chamber flanges were also located. However, the actual Z locations were not measured.

|                 | Ideal (Meters)             |         |          | Found (Meters)      |           |          | Deltas (mm) |       |       |
|-----------------|----------------------------|---------|----------|---------------------|-----------|----------|-------------|-------|-------|
|                 | X                          | Y       | Z        | X                   | Y         | Z        | X           | Y     | Z     |
| Wire Detector 1 | 0.00000                    | 1.50449 | 17.48983 | 0.00019             | 1.50276   | 17.48349 | 0.19        | -1.73 | -6.34 |
| Wire Detector 2 | 0.00000                    | 1.75903 | 18.25495 | 0.00013             | 1.75685   | 18.24864 | 0.13        | -2.18 | -6.31 |
|                 |                            |         |          |                     |           |          |             |       |       |
|                 | Beam Following Deltas (mm) |         |          | Rotations (degrees) |           |          |             |       |       |
|                 | X                          | Y       | Z        | Rx from Y           | Ry from Z |          |             |       |       |
| Wire Detector 1 | 0.19                       | 0.36    | -6.56    | 0.006               | 0.006     |          |             |       |       |
| Wire Detector 2 | 0.13                       | -0.08   | -6.68    | -0.001              | 0.035     |          |             |       |       |
| Gas Chamber     |                            |         |          |                     |           |          |             |       |       |
| Us Flange       | 0.85                       | 0.23    |          |                     |           |          |             |       |       |
| DS Flange       | 0.75                       | 4.47    |          |                     |           |          |             |       |       |