



# Jefferson Lab Alignment Group

## Data Transmittal

**TO:** D. Gaskel, B. Sawatzky, M. Jones

**DATE:** 06/07/2017

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**Checked:** (seh)

**# :** C1792r

**DETAILS:**

data: aalign\HMS\H053017

Below are the results from the survey of HMS spectrometer on May 30<sup>th</sup>, 2017. The horizontal pointing value shows how much the central axis of the spectrometer misses the ideal target. This value is perpendicular to the spectrometer axis, not along the beam line. For the vertical pointing, a positive value indicates that the spectrometer is pointing above the target.

This survey is different from typical surveys as observations were taken from both sides of the spectrometer. From this data, three sets of results were calculated: using the combined data and both left and right sides. The results show good agreement.

===== RESULTS – Combined ===== H053017

The central ray of the spectrometer is at 40.534 degrees  
The central ray is missing the defined target center by 3.45 [mm] Upstream  
and -0.91 mm vertically [positive value is up]

9 Par A posteriori value : 0.60 (mm)

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===== RESULTS – Right ===== H053017

The central ray of the spectrometer is at 40.532 degrees  
The central ray is missing the defined target center by 3.31 [mm] Upstream  
and -1.09 mm vertically [positive value is up]

9 Par A posteriori value : 0.74 (mm)

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===== RESULTS – Left ===== H053017

The central ray of the spectrometer is at 40.534 degrees  
The central ray is missing the defined target center by 3.33 [mm] Upstream  
and -0.84 mm vertically [positive value is up]

9 Par A posteriori value : 0.55 (mm)

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The sketches below illustrate the errors for the combination survey, the right side data and the left side data.

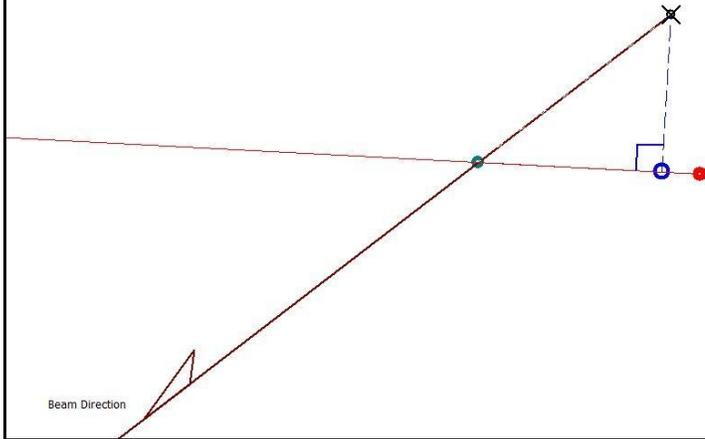
Combo

H053017

- Beam-Spec Intercept Point
- Beam-Spec Perpendicular Point
- Spectrometer Projected Target Point
- ✕ Straight-Ahead Target Point [ideal]

angles: delta : 40.53391 [degrees]  
beam : -142.48325 [degrees]  
spectrometer: 176.98284 [degrees]  
perpendicular distance : 3.451 [mm]  
target - intersect dis : 5.311 [mm]  
found target - intersect dis : 4.859 [mm]  
Spectrometer is -0.91 lower than ideal target [mm]

- Spectrometer Line
- Straight-Ahead Beam
- Perpendicular line



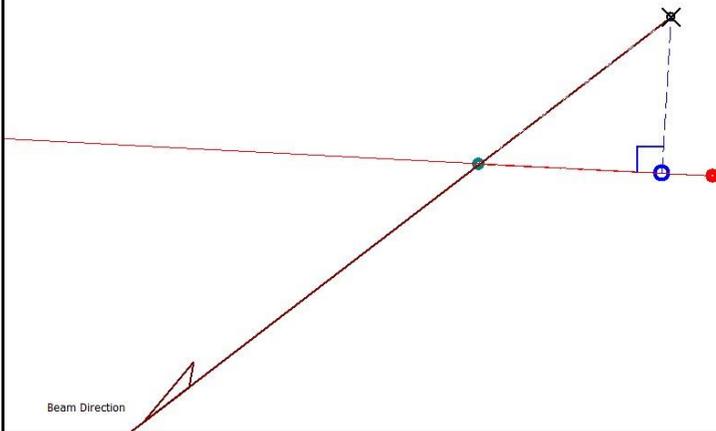
Right

H053017

- Beam-Spec Intercept Point
- Beam-Spec Perpendicular Point
- Spectrometer Projected Target Point
- ✕ Straight-Ahead Target Point [ideal]

angles: delta : 40.53183 [degrees]  
beam : -142.48325 [degrees]  
spectrometer: 176.98492 [degrees]  
perpendicular distance : 3.309 [mm]  
target - intersect dis : 5.091 [mm]  
found target - intersect dis : 4.935 [mm]  
Spectrometer is -1.09 lower than ideal target [mm]

- Spectrometer Line
- Straight-Ahead Beam
- Perpendicular line



Left

H053017

- Beam-Spec Intercept Point
- Beam-Spec Perpendicular Point
- Spectrometer Projected Target Point
- ✕ Straight-Ahead Target Point [ideal]

angles: delta : 40.53363 [degrees]  
beam : -142.48325 [degrees]  
spectrometer: 176.98312 [degrees]

perpendicular distance : 3.336 [mm]  
target - intersect dis : 5.134 [mm]  
found target - intersect dis : 4.628 [mm]  
Spectrometer is -0.84 lower than ideal target [mm]

- Spectrometer Line
- Straight-Ahead Beam
- Perpendicular line

