

Jefferson Lab Alignment Group

DATA TRANSMITTAL

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DETAILS:

Attached are three pages relating to the surveys performed on the Hall A superharp/BPM assemblies from March 31st to December 13th, 1999. These results repeat and update those presented in DataTransmittal #564, dated 3rd Dec. 1999.

The first section of the table on page 1 shows the control points used in the theodolite surveys. An "X" indicates the point was used and held fixed, a "F" indicates that the point was floated vertically.

The "Theodolite Survey" part of the table shows the angles of each spectrometer, the overall standard error of the adjustment ("FAK"), and the individual standard errors of the X coordinate for superharp tooling balls 1b and 2b. Tooling ball 'a' is beam right, 'b' is center, and 'c' is beam left. The X position (in mm) of the tooling ball with respect to its ideal location is shown (negative X indicating it is to the beam right).

The "Optical Tooling" results show the location of tooling ball B on each of the superharps relative to a single line of sight defined by control points located close to the beamline.

The second page is a graph of the X locations from the optical tooling and theodolite surveys. Clearly the surveys of E091099 and E120899 do not agree. In both cases the theodolite survey is consistent with other results, but the optical tooling is not. The E091099 survey did not contain the necessary checks, such that the results may be in doubt. The optical tooling survey compared to the E120899 survey was actually carried out the next day with the target can open. This may explain the difference between the surveys.

The final page contains the full results of the theodolite surveys - DZ, DX and DY. The averages of each component are shown together with the residuals from the overall averages.

Following installation activity in January a 3mm movement was found. The superharps were adjusted back close to nominal. This and the most recent survey is shown below (DX in mm).

| | 1a | 1b | 1c | 2a | 2b | 2c |
|---------|-----------|-----------|-----------|-----------|-----------|-----------|
| E020200 | -0.04 | -0.03 | +0.03 | -0.11 | -0.06 | -0.04 |
| E022200 | -0.14 | -0.11 | -0.05 | -0.26 | -0.23 | -0.20 |