

E1200625-v4

Local Coordinates of Support Tube Ends

This notebook calculates/provides the positions of the centers of the ends of each support tube (for both BSC and HAM chambers) in the building local gravity vector frame. These values can be used to position (or check) that the support tubes are in the proper locations to place the ISI optics tables in their proper locations.

Version History

Ver. 1 D. Coyne 6/16/2012

Ver. 2 D. Coyne 6/21/2012

Ver. 3 D. Coyne 7/31/2012

Ver. 4 D. Coyne 10/3/2012

- Correction to the vertical distance between the HAM support tube centers and the global axes (had previously used the distance from the support tube center to the HAM nozzle B center rather than to the global axis).
- Also tables with local coordinates were incorrectly labeled "global".
- Added global and local coordinate tables for all chambers
- Note that there were small discrepancies between the location of the support tube end centers compared to SolidWorks (e.g. LHAM2, D0900365-x094).
 - a) The vertical distance from support tube center to global axis is 1209.57 mm in SW, whereas in this notebook it was 1209.98 mm. A difference of 0.41 mm. Most of this difference is due to the fact that the SW model has the distance between the support tube center and the nozzle B center as 43.685" whereas this notebook uses the value of 43.70" (a difference of 0.38 mm) from v049-4-128, rev 3, sh1. Since this difference is within the tolerances of the chamber shell, to be consistent with SW, I have changed this dimension to 43.685" (still leaving a difference of 0.02 mm between SW and this notebook).
 - b) The support tubes in the SW model of LHAM2 (D0900365-x094) are 26.995" and 27.005" laterally separated from the center of the nozzle B center, or 54.000" total. The value for this dimension used in this notebook was 53-15/16" in accordance with PSI v049-4-002, rev 4. Since this difference is within the tolerances of the chamber shell, to be consistent with SW, I have changed this dimension to 54.000".
 - c) The ends of the support tubes in the SW model of LHAM2 (D0900365-x094) are 47.095" from the center of the HAM chamber. The value for this dimension in this notebook was and remains the same.

0.2. Initialization

0.3. Global to Local Coordinate Transformation Matrices

0.4. Chamber Center Global Coordinates

0.5.0. Local Coordinates

0.5.1. H1

H1 Chambers

BSC Support Tubes Ends

HAM Support Tubes Ends

Plot of corner station pier end positions

H1 Summary

WBSCTableG

	x_global	y_global	z_global
WBSC1	0	4580	0
WBSC2	0	0	0
WBSC3	4580	0	0
WBSC9	4 000 000	0	0
WBSC10	0	4 000 000	0

WHAMTableG

	x_global	y_global	z_global
WHAM1	-22 726.7	0	0
WHAM2	-20 122	0	0
WHAM3	-3831	0	0
WHAM4	0	-3831	0
WHAM5	0	-20 122	0
WHAM6	0	-22 726.7	0

WBSCTableL

	x_local	y_local	z_local
WBSC1	0.0000354181	4580.	0.057173
WBSC2	0.	0.	0.
WBSC3	4580.	0.	-2.83726
WBSC9	0.	0.	0.
WBSC10	0.	0.	0.

WHAMTableL

	x_local	y_local	z_local
WHAM1	-22 726.7	0.	14.079
WHAM2	-20 122.	0.	12.4654
WHAM3	-3831.	0.	2.37327
WHAM4	-0.000029626	-3831.	-0.0478231
WHAM5	-0.000155608	-20 122.	-0.251187
WHAM6	-0.000175751	-22 726.7	-0.283702

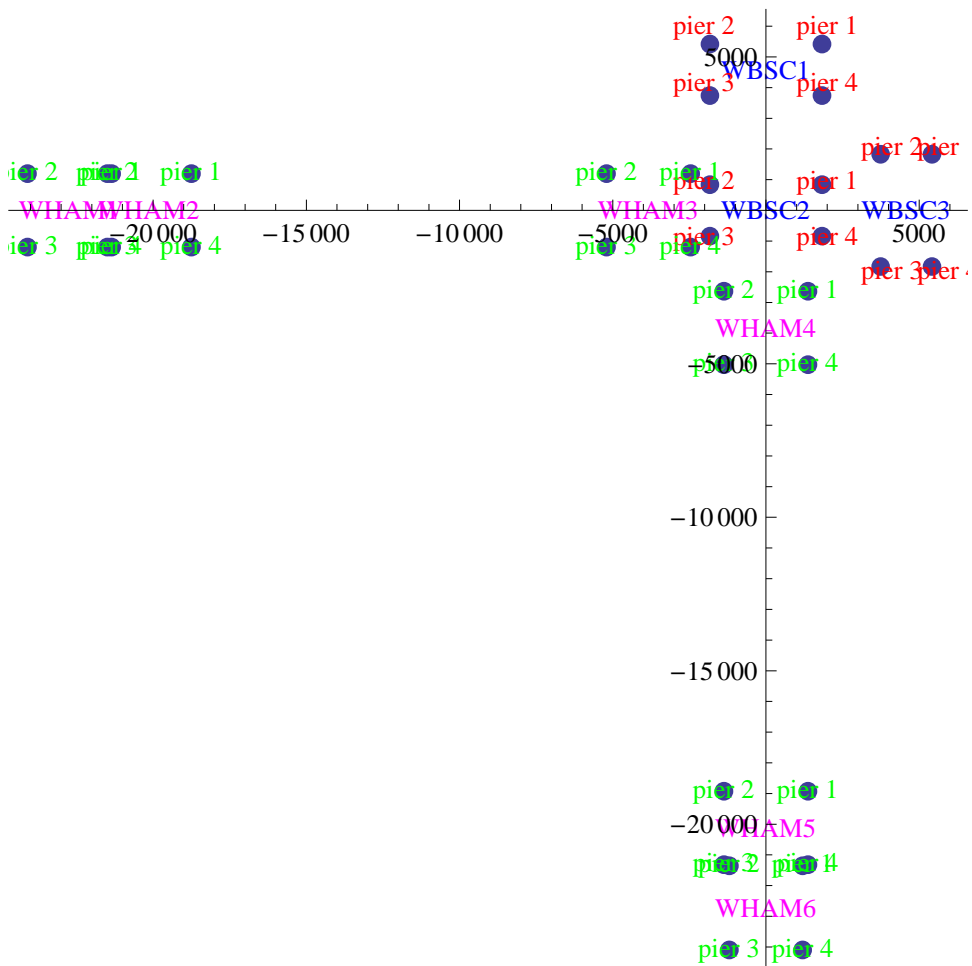
tableBSCsupportTubesH1

	pier	x_local	y_local	z_local
WBSC1	pier 1	1828.8	5418.2	1130.36
WBSC1	pier 2	-1828.8	5418.2	1130.36
WBSC1	pier 3	-1828.8	3741.8	1130.36
WBSC1	pier 4	1828.8	3741.8	1130.36
WBSC2	pier 1	1828.8	838.2	1127.4
WBSC2	pier 2	-1828.8	838.2	1127.4
WBSC2	pier 3	-1828.8	-838.2	1127.4
WBSC2	pier 4	1828.8	-838.2	1127.4
WBSC3	pier 1	5418.2	1828.8	1127.46
WBSC3	pier 2	3741.8	1828.8	1127.46
WBSC3	pier 3	3741.8	-1828.8	1127.46
WBSC3	pier 4	5418.2	-1828.8	1127.46
WBSC9	pier 1	1828.8	838.2	1130.3
WBSC9	pier 2	-1828.8	838.2	1130.3
WBSC9	pier 3	-1828.8	-838.2	1130.3
WBSC9	pier 4	1828.8	-838.2	1130.3
WBSC10	pier 1	838.2	1828.8	1130.3
WBSC10	pier 2	-838.2	1828.8	1130.3
WBSC10	pier 3	-838.2	-1828.8	1130.3
WBSC10	pier 4	838.2	-1828.8	1130.3

tableHAMsupportTubesH1

	pier	x_local	y_local	z_local
WHAM1	pier 1	-21 355.1	1196.21	-1195.52
WHAM1	pier 2	-24 098.3	1196.21	-1195.52
WHAM1	pier 3	-24 098.3	-1196.21	-1195.52
WHAM1	pier 4	-21 355.1	-1196.21	-1195.52
WHAM2	pier 1	-18 750.4	1196.21	-1197.13
WHAM2	pier 2	-21 493.6	1196.21	-1197.13
WHAM2	pier 3	-21 493.6	-1196.21	-1197.13
WHAM2	pier 4	-18 750.4	-1196.21	-1197.13
WHAM3	pier 1	-2459.4	1196.21	-1207.23
WHAM3	pier 2	-5202.6	1196.21	-1207.23
WHAM3	pier 3	-5202.6	-1196.21	-1207.23
WHAM3	pier 4	-2459.4	-1196.21	-1207.23
WHAM4	pier 1	1371.6	-2634.79	-1209.65
WHAM4	pier 2	-1371.6	-2634.79	-1209.65
WHAM4	pier 3	-1371.6	-5027.21	-1209.65
WHAM4	pier 4	1371.6	-5027.21	-1209.65
WHAM5	pier 1	1371.6	-18 925.8	-1209.85
WHAM5	pier 2	-1371.6	-18 925.8	-1209.85
WHAM5	pier 3	-1371.6	-21 318.2	-1209.85
WHAM5	pier 4	1371.6	-21 318.2	-1209.85
WHAM6	pier 1	1196.21	-21 355.1	-1209.88
WHAM6	pier 2	-1196.21	-21 355.1	-1209.88
WHAM6	pier 3	-1196.21	-24 098.3	-1209.88
WHAM6	pier 4	1196.21	-24 098.3	-1209.88

plotSupportTubesH1



0.5.2. L1

L1 Chambers

BSC Support Tubes Ends

HAM Support Tubes Ends

Plot of corner station pier end positions

L1 Summary

LBSCTableG

	x_global	y_global	z_global
LBSC1	0.	4580.	0.
LBSC2	0.	0.	0.
LBSC3	4580.	0.	0.
LBSC4	$4. \times 10^6$	0.	0.
LBSC5	0.	$4. \times 10^6$	0.

LHAMTableG

	x_global	y_global	z_global
LHAM1	-22 726.7	0.	0.
LHAM2	-20 122.	0.	0.
LHAM3	-3831.	0.	0.
LHAM4	0.	-3831.	0.
LHAM5	0.	-20 122.	0.
LHAM6	0.	-22 726.7	0.

LBSCTableL

	x_local	y_local	z_local
LBSC1	-0.000873094	4580.	-2.79838
LBSC2	0.	0.	0.
LBSC3	4580.	0.	-1.42896
LBSC4	0.	0.	0.
LBSC5	0.	0.	0.

LHAMTableL

	x_local	y_local	z_local
LHAM1	-22 726.7	0.	7.09073
LHAM2	-20 122.	0.	6.27806
LHAM3	-3831.	0.	1.19527
LHAM4	0.000730311	-3831.	2.34074
LHAM5	0.0038359	-20 122.	12.2945
LHAM6	0.00433244	-22 726.7	13.886

tableBSCsupportTubesL1

	pier	x_local	y_local	z_local
LBSC1	pier 1	1828.8	5418.2	1127.5
LBSC1	pier 2	-1828.8	5418.2	1127.5
LBSC1	pier 3	-1828.8	3741.8	1127.5
LBSC1	pier 4	1828.8	3741.8	1127.5
LBSC2	pier 1	1828.8	838.2	1127.4
LBSC2	pier 2	-1828.8	838.2	1127.4
LBSC2	pier 3	-1828.8	-838.2	1127.4
LBSC2	pier 4	1828.8	-838.2	1127.4
LBSC3	pier 1	5418.2	1828.8	1128.87
LBSC3	pier 2	3741.8	1828.8	1128.87
LBSC3	pier 3	3741.8	-1828.8	1128.87
LBSC3	pier 4	5418.2	-1828.8	1128.87
LBSC4	pier 1	1828.8	838.2	1130.3
LBSC4	pier 2	-1828.8	838.2	1130.3
LBSC4	pier 3	-1828.8	-838.2	1130.3
LBSC4	pier 4	1828.8	-838.2	1130.3
LBSC5	pier 1	838.2	1828.8	1130.3
LBSC5	pier 2	-838.2	1828.8	1130.3
LBSC5	pier 3	-838.2	-1828.8	1130.3
LBSC5	pier 4	838.2	-1828.8	1130.3

tableHAMsupportTubesL1

	pier	x_local	y_local	z_local
LHAM1	pier 1	-21 355.1	1196.21	-1202.51
LHAM1	pier 2	-24 098.3	1196.21	-1202.51
LHAM1	pier 3	-24 098.3	-1196.21	-1202.51
LHAM1	pier 4	-21 355.1	-1196.21	-1202.51
LHAM2	pier 1	-18 750.4	1196.21	-1203.32
LHAM2	pier 2	-21 493.6	1196.21	-1203.32
LHAM2	pier 3	-21 493.6	-1196.21	-1203.32
LHAM2	pier 4	-18 750.4	-1196.21	-1203.32
LHAM3	pier 1	-2459.4	1196.21	-1208.4
LHAM3	pier 2	-5202.6	1196.21	-1208.4
LHAM3	pier 3	-5202.6	-1196.21	-1208.4
LHAM3	pier 4	-2459.4	-1196.21	-1208.4
LHAM4	pier 1	1371.6	-2634.79	-1207.26
LHAM4	pier 2	-1371.6	-2634.79	-1207.26
LHAM4	pier 3	-1371.6	-5027.21	-1207.26
LHAM4	pier 4	1371.6	-5027.21	-1207.26
LHAM5	pier 1	1371.6	-18 925.8	-1197.3
LHAM5	pier 2	-1371.6	-18 925.8	-1197.3
LHAM5	pier 3	-1371.6	-21 318.2	-1197.3
LHAM5	pier 4	1371.6	-21 318.2	-1197.3
LHAM6	pier 1	1196.22	-21 355.1	-1195.71
LHAM6	pier 2	-1196.21	-21 355.1	-1195.71
LHAM6	pier 3	-1196.21	-24 098.3	-1195.71
LHAM6	pier 4	1196.22	-24 098.3	-1195.71

plotSupportTubesL1

