

# E1200625-v3

# 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

Incorrect positions for HAM1 and HAM6 were used in previous versions; The thickness of the septum plate was not taken into account. As a consequence these 2 chambers are 1.38 in closer to the global origin than in reality. This is corrected in version 3.

## 0.2. Intialization

## 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

(Debug) In[290]:=

#### WBSCTable

(Debug) Out[290]/TableForm=

	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

(Debug) In[291]:=

#### WHAMTable

(Debug) Out[291]/TableForm=

	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

(Debug) In[292]:=

**tableBSCsupportTubesH1**

(Debug) Out[292]//TableForm=

	pier	x_global	y_global	z_global
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

(Debug) In[293]:=

**tableHAMsupportTubesH1**

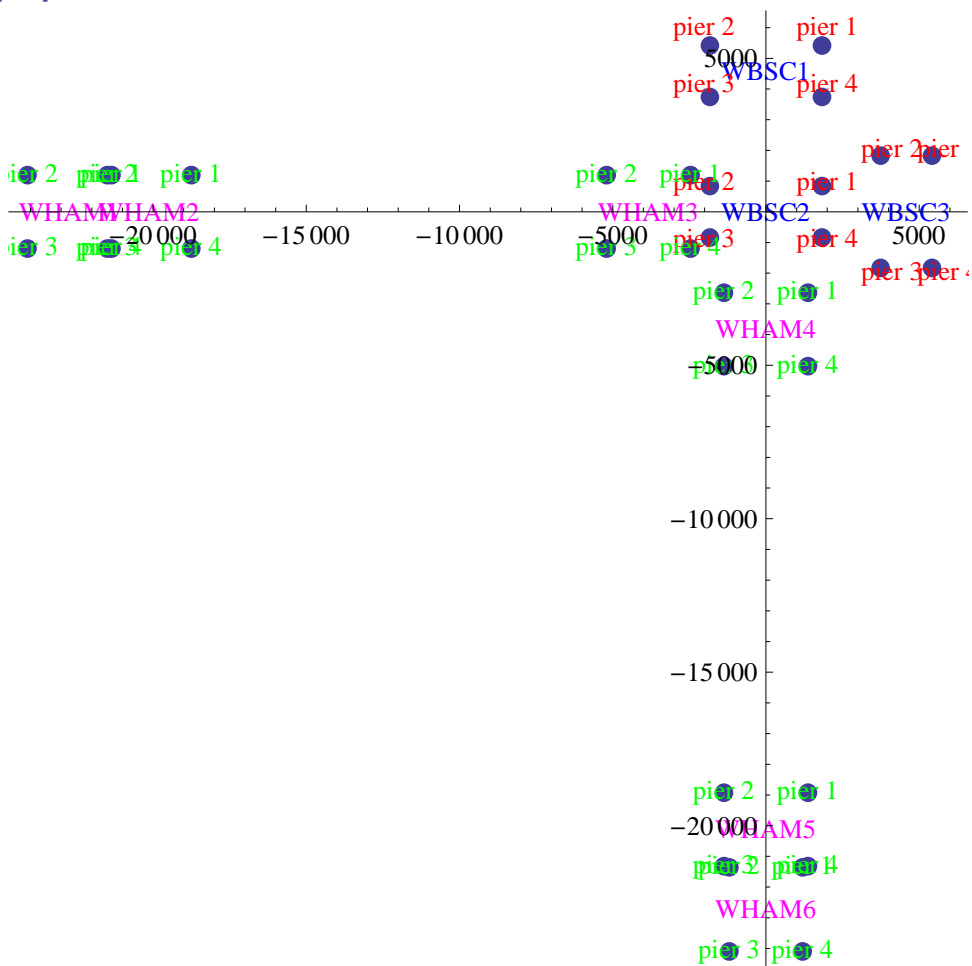
(Debug) Out[293]/TableForm=

	pier	x_global	y_global	z_global
WHAM1	pier 1	-21 356.7	1196.21	-1095.9
WHAM1	pier 2	-24 096.7	1196.21	-1095.9
WHAM1	pier 3	-24 096.7	-1196.21	-1095.9
WHAM1	pier 4	-21 356.7	-1196.21	-1095.9
WHAM2	pier 1	-18 752.	1196.21	-1097.51
WHAM2	pier 2	-21 492.	1196.21	-1097.51
WHAM2	pier 3	-21 492.	-1196.21	-1097.51
WHAM2	pier 4	-18 752.	-1196.21	-1097.51
WHAM3	pier 1	-2460.99	1196.21	-1107.61
WHAM3	pier 2	-5201.01	1196.21	-1107.61
WHAM3	pier 3	-5201.01	-1196.21	-1107.61
WHAM3	pier 4	-2460.99	-1196.21	-1107.61
WHAM4	pier 1	1370.01	-2634.79	-1110.03
WHAM4	pier 2	-1370.01	-2634.79	-1110.03
WHAM4	pier 3	-1370.01	-5027.21	-1110.03
WHAM4	pier 4	1370.01	-5027.21	-1110.03
WHAM5	pier 1	1370.01	-18 925.8	-1110.23
WHAM5	pier 2	-1370.01	-18 925.8	-1110.23
WHAM5	pier 3	-1370.01	-21 318.2	-1110.23
WHAM5	pier 4	1370.01	-21 318.2	-1110.23
WHAM6	pier 1	1196.21	-21 356.7	-1110.26
WHAM6	pier 2	-1196.21	-21 356.7	-1110.26
WHAM6	pier 3	-1196.21	-24 096.7	-1110.26
WHAM6	pier 4	1196.21	-24 096.7	-1110.26

(Debug) In[294]:=

**plotSupportTubesH1**

(Debug) Out[294]=



(Debug) In[328]:=

**LHAMTable**

(Debug) Out[328]/TableForm=

	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.

(Debug) In[329]:=

**tableBSCsupportTubesL1**

(Debug) Out[329]/TableForm=

	pier	x_global	y_global	z_global
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

(Debug) In[330]:=

**tableHAMsupportTubesL1**

(Debug) Out[330]/TableForm=

	pier	x_global	y_global	z_global
LHAM1	pier 1	-21 356.7	1196.21	-1102.89
LHAM1	pier 2	-24 096.7	1196.21	-1102.89
LHAM1	pier 3	-24 096.7	-1196.21	-1102.89
LHAM1	pier 4	-21 356.7	-1196.21	-1102.89
LHAM2	pier 1	-18 752.	1196.21	-1103.7
LHAM2	pier 2	-21 492.	1196.21	-1103.7
LHAM2	pier 3	-21 492.	-1196.21	-1103.7
LHAM2	pier 4	-18 752.	-1196.21	-1103.7
LHAM3	pier 1	-2460.99	1196.21	-1108.78
LHAM3	pier 2	-5201.01	1196.21	-1108.78
LHAM3	pier 3	-5201.01	-1196.21	-1108.78
LHAM3	pier 4	-2460.99	-1196.21	-1108.78
LHAM4	pier 1	1370.01	-2634.79	-1107.64
LHAM4	pier 2	-1370.01	-2634.79	-1107.64
LHAM4	pier 3	-1370.01	-5027.21	-1107.64
LHAM4	pier 4	1370.01	-5027.21	-1107.64
LHAM5	pier 1	1370.02	-18 925.8	-1097.69
LHAM5	pier 2	-1370.01	-18 925.8	-1097.69
LHAM5	pier 3	-1370.01	-21 318.2	-1097.69
LHAM5	pier 4	1370.02	-21 318.2	-1097.69
LHAM6	pier 1	1196.22	-21 356.7	-1096.09
LHAM6	pier 2	-1196.21	-21 356.7	-1096.09
LHAM6	pier 3	-1196.21	-24 096.7	-1096.09
LHAM6	pier 4	1196.22	-24 096.7	-1096.09

(Debug) In[331]:=

**plotSupportTubesL1**

(Debug) Out[331]=

