

# Geometries of $^3\text{He}$ cell

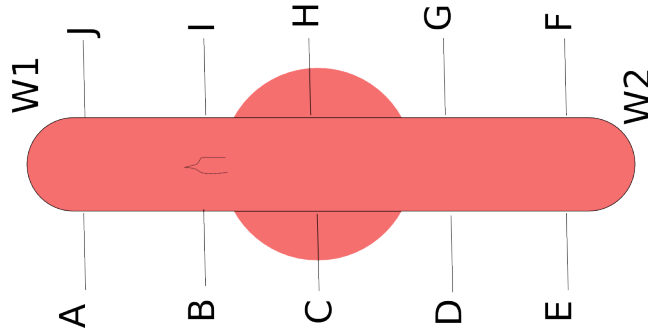
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## 1 Wall & window thickness of $^3\text{He}$ cell

### Convention: (bottom view)

As I checked with Joe, the pull-off were always in the upstream side. So W1 was upstream window, A-B-C-D-E side was the wall LHRs saw.



- For Astralweek:

Points	Position	Incident	Results (mm)	File
A	$ w1-\>A  = 2 \text{ cm}$	$\theta = 14^\circ$	1.685	astral_jy16_a1
B	$ w1-\>B  = 13 \text{ cm}$	$\theta = 10^\circ$	1.668	astral_jy16_b1
C	$ w1-\>C  = 20 \text{ cm}$	$\theta = 8^\circ$	1.676	astral_jy16_c1
D	$ D-\>w2  = 13 \text{ cm}$	$\theta = 17^\circ$	1.716	astral_jy16_d1
-	-	-	-	astral_jy16_d2(bkg)
E	$ E-\>w2  = 4 \text{ cm}$	$\theta = 8^\circ$	1.692	astral_jy16_e1
F	$ F-\>w2  = 2 \text{ cm}$	$\theta = 12^\circ$	1.731	astral_jy17_f1
G	$ G-\>w2  = 13 \text{ cm}$	$\theta = 13^\circ$	1.596	astral_jy17_g1
H	$ H-\>w2  = 20 \text{ cm}$	$\theta = 12^\circ$	1.577	astral_jy17_h1
-	-	-	-	astral_jy17_h2(bkg)
I	$ w1-\>I  = 13 \text{ cm}$	$\theta = 12^\circ$	1.641	astral_jy17_i1
J	$ w1-\>J  = 4 \text{ cm}$	$\theta = 10^\circ$	1.727	astral_jy17_j1
W1	-	$\theta = 11^\circ$	0.123	astral_jy16_w11
W2	-	$\theta = 16^\circ$	0.145	astral_jy16_w21
-	-	-	-	astral_jy16_w22(bkg)

- For Maureen:

Points	Position	Incident	Results (mm)	File
A	$ w1-\>A  = 4 \text{ cm}$	$\theta = 13^\circ$	1.700	maureen_jy22_a1
B	$ w1-\>B  = 15 \text{ cm}$	$\theta = 18^\circ$	1.595	maureen_jy22_b1
C	$ w1-\>C  = 20 \text{ cm}$	$\theta = 15^\circ$	1.565	maureen_jy23_c1
-	-	-	-	maureen_jy23_c2(bkg)
D	$ D-\>w2  = 12 \text{ cm}$	$\theta = 9^\circ$	1.557	maureen_jy23_d1
E	$ E-\>w2  = 4.5 \text{ cm}$	$\theta = 10^\circ$	1.538	maureen_jy23_e1
F	$ F-\>w2  = 4.5 \text{ cm}$	$\theta = 11^\circ$	1.645	maureen_jy23_f1
G	$ G-\>w2  = 12 \text{ cm}$	$\theta = 10^\circ$	1.481	maureen_jy23_g1
H	$ H-\>w2  = 19 \text{ cm}$	$\theta = 13^\circ$	1.506	maureen_jy23_h1
I	$ w1-\>I  = 13 \text{ cm}$	$\theta = 14^\circ$	1.587	maureen_jy24_i1
J	$ w1-\>J  = 4 \text{ cm}$	$\theta = 15^\circ$	1.553	maureen_jy24_j1
W1	-	$\theta = 19^\circ$	0.119	maureen_jy24_w11
W2	-	$\theta = 16^\circ$	0.120	maureen_jy24_w21

- For Brady:

Points	Position	Incident	Results (mm)	File
A	$ \mathbf{w1} \cdot \mathbf{A}  = 5 \text{ cm}$	$\theta = 19^\circ$	<b>1.698</b>	brady_jy8_a1
B	$ \mathbf{w1} \cdot \mathbf{B}  = 12 \text{ cm}$	$\theta = 24^\circ$	<b>1.820</b>	brady_jy8_b1
-	-	-	-	brady_jy8_b2(bkg)
C	$ \mathbf{w1} \cdot \mathbf{C}  = 18 \text{ cm}$	$\theta = 18^\circ$	<b>1.705</b>	brady_jy8_c1
-	-	-	-	brady_jy8_c2(bkg)
D	$ \mathbf{D} \cdot \mathbf{w2}  = 12 \text{ cm}$	$\theta = 11^\circ$	<b>1.721</b>	brady_jy10_d1
E	$ \mathbf{E} \cdot \mathbf{w2}  = 2 \text{ cm}$	$\theta = 10^\circ$	<b>1.592</b>	brady_jy10_e1
-	-	-	-	brady_jy10_e2(bkg)
F	$ \mathbf{F} \cdot \mathbf{w2}  = 3 \text{ cm}$	$\theta = 9^\circ$	<b>1.503</b>	brady_jy13_f1
G	$ \mathbf{G} \cdot \mathbf{w2}  = 13 \text{ cm}$	$\theta = 10^\circ$	<b>1.623</b>	brady_jy13_g1
-	-	-	-	brady_jy13_g3(bkg)
H	$ \mathbf{H} \cdot \mathbf{w2}  = 18 \text{ cm}$	$\theta = 12^\circ$	<b>1.638</b>	brady_jy14_h1
I	$ \mathbf{w1} \cdot \mathbf{I}  = 14 \text{ cm}$	$\theta = 10^\circ$	<b>1.663</b>	brady_jy14_i7
J	$ \mathbf{w1} \cdot \mathbf{J}  = 3 \text{ cm}$	$\theta = 8^\circ$	<b>1.670</b>	brady_jy16_j1
-	-	-	-	brady_jy16_j2(bkg)
W1	-	$\theta = 21^\circ$	<b>0.150</b>	brady_jy7_w11
W2	-	$\theta = 19.5^\circ$	<b>0.145</b>	brady_jy10_w21
-	-	-	-	brady_jy10_w22(bkg)

## 2 Diameter of target chamber

- For Astralweek: (in inch)

	1	2	3	4	5	Mean	Error
A	0.7435	0.7432	0.7432	0.7418	0.7435	0.7430	0.0005
B	0.7465	0.7462	0.7469	0.7470	0.7470	0.7467	0.0003
C	0.7515	0.7520	0.7506	0.7509	0.7514	0.7513	0.0004
D	0.7530	0.7527	0.7533	0.7519	0.7529	0.7528	0.0004
E	0.7430	0.7454	0.7440	0.7445	0.7449	0.7444	0.0007

So the average radii in mm is  $9.495 \pm 0.090$

- For Brady: (in inch)

	1	2	3	4	5	Mean	Error
A	0.7655	0.7585	0.7620	0.7579	0.7680	0.7624	0.0035
B	0.7251	0.7260	0.7290	0.7280	0.7308	0.7278	0.0018
C	0.7272	0.7272	0.7262	0.7262	0.7284	0.7270	0.0007
D	0.7326	0.7338	0.7325	0.7329	0.7305	0.7325	0.0008
E	0.7606	0.7566	0.7550	0.7604	0.7627	0.7591	0.0026

So the average radii in mm is  $9.420 \pm 0.386$

- For Maureen: (in inch)

	1	2	3	4	5	Mean	Error
A	0.7639	0.7650	0.7652	0.7650	0.7655	0.7649	0.0004
B	0.7438	0.7442	0.7445	0.7440	0.7445	0.7442	0.0002
C	0.7459	0.7460	0.7460	0.7459	0.7458	0.7459	0.0001
D	0.7480	0.7482	0.7480	0.7481	0.7500	0.7485	0.0006
E	0.7650	0.7652	0.7662	0.7666	0.7650	0.7656	0.0006

So the average radii in mm is  $9.574 \pm 0.232$

## UVa Transversity Cell Properties from Gas System & Buoyancy

Vertical **90-deg** cells in **red**

Cell	$\rho_{\text{He}}$ (amg)	$\rho_{\text{N}_2}$ (amg)	$V_{\text{PC}}$ (cc)	$V_{\text{TT}}$ (cc)	$V_{\text{TC}}$ (cc)
<b>Antoinette</b>	<b>6.81</b>	<b>0.115</b>	<b>339.5</b>	<b>6.8</b>	<b>76.3</b>
<b>Astralweek</b>	<b><math>8.082 \pm 0.073</math></b>	<b><math>0.1138 \pm 0.002</math></b>	<b>164.92</b>	<b>6.77</b>	<b>79.47</b>
<b>Brady</b>	<b><math>7.868 \pm 0.070</math></b>	<b><math>0.1138 \pm 0.002</math></b>	<b>169.27</b>	<b>5.98</b>	<b>74.57</b>
<b>Melissa</b>	<b><math>7.894 \pm 0.072</math></b>	<b><math>0.1118 \pm 0.002</math></b>	<b>173.66</b>	<b>6.44</b>	<b>73.55</b>
<b>Stephanie</b>	<b><math>8.022 \pm 0.073</math></b>	<b><math>0.1142 \pm 0.002</math></b>	<b>164.62</b>	<b>5.99</b>	<b>73.24</b>

No Buoyancy on Antoinette at this time

PRELIMINARY: Al Tobias, Feb 26, 2009