

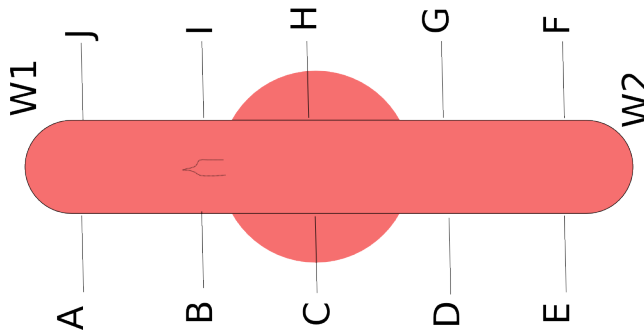
Geometries of ${}^3\text{He}$ cell

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

Convention: (bottom view)



- For Astralweek:

Points	Position	Incident	Results (mm)	File
A	$ \text{w1} \rightarrow \text{A} = 2 \text{ cm}$	$\theta = 14^\circ$	1.685	astral_jy16_a1
B	$ \text{w1} \rightarrow \text{B} = 13 \text{ cm}$	$\theta = 10^\circ$	1.668	astral_jy16_b1
C	$ \text{w1} \rightarrow \text{C} = 20 \text{ cm}$	$\theta = 8^\circ$	1.676	astral_jy16_c1
D	$ \text{D} \rightarrow \text{w2} = 13 \text{ cm}$	$\theta = 17^\circ$	1.716	astral_jy16_d1
-	-	-	-	astral_jy16_d2(bkg)
E	$ \text{E} \rightarrow \text{w2} = 4 \text{ cm}$	$\theta = 8^\circ$	1.692	astral_jy16_e1
F	$ \text{F} \rightarrow \text{w2} = 2 \text{ cm}$	$\theta = 12^\circ$	1.731	astral_jy17_f1
G	$ \text{G} \rightarrow \text{w2} = 13 \text{ cm}$	$\theta = 13^\circ$	1.596	astral_jy17_g1
H	$ \text{H} \rightarrow \text{w2} = 20 \text{ cm}$	$\theta = 12^\circ$	1.577	astral_jy20_h1
-	-	-	-	astral_jy20_h2(bkg)
I	$ \text{w1} \rightarrow \text{I} = 13 \text{ cm}$	$\theta = 12^\circ$	1.641	astral_jy17_i1
J	$ \text{w1} \rightarrow \text{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	$ w1-\>A = 5 \text{ cm}$	$\theta = 19^\circ$	1.698	brady_jy8_a1
B	$ w1-\>B = 12 \text{ cm}$	$\theta = 24^\circ$	1.820	brady_jy8_b1
-	-	-	-	brady_jy8_b2(bkg)
C	$ w1-\>C = 18 \text{ cm}$	$\theta = 18^\circ$	1.705	brady_jy8_c1
-	-	-	-	brady_jy8_c2(bkg)
D	$ D-\>w2 = 12 \text{ cm}$	$\theta = 11^\circ$	1.721	brady_jy10_d1
E	$ E-\>w2 = 2 \text{ cm}$	$\theta = 10^\circ$	1.592	brady_jy10_e1
-	-	-	-	brady_jy10_e2(bkg)
F	$ F-\>w2 = 3 \text{ cm}$	$\theta = 9^\circ$	1.503	brady_jy13_f1
G	$ G-\>w2 = 13 \text{ cm}$	$\theta = 10^\circ$	1.623	brady_jy13_g1
-	-	-	-	brady_jy13_g3(bkg)
H	$ H-\>w2 = 18 \text{ cm}$	$\theta = 12^\circ$	1.638	brady_jy14_h1
I	$ w1-\>I = 14 \text{ cm}$	$\theta = 10^\circ$	1.663	brady_jy14_i7
J	$ w1-\>J = 3 \text{ cm}$	$\theta = 8^\circ$	1.670	brady_jy16_j1
-	-	-	-	brady_jy16_j2(bkg)
W1	-	$\theta = 21^\circ$	0.150	brady_jy7_w11
W2	-	$\theta = 19.5^\circ$	0.145	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 ± 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 ± 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 ± 0.232

UVa d2n Cell Properties from Gas System & Buoyancy

Longitudinal 42-deg cells in blue

Cell	ρ_{He} (amg)	ρ_{N_2} (amg)	V_{PC} (cc)	V_{TT} (cc)	V_{TC} (cc)
Alex	7.932±0.072	0.1133±0.002	193.85	6.92	77.29
Boris	7.993±0.072	0.1126±0.002	166.13	5.83	73.91
Moss	7.808±0.071	0.1132±0.002	184.13	6.54	78.23
Samantha	7.847±0.070	0.1125±0.002	176.90	6.51	75.47
Tigger	7.807±0.071	0.1124±0.002	186.94	6.35	78.36

PRELIMINARY: Al Tobias, May 5, 2009