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MOL dipol box;	Nine – dy hown in d tandard H SOL refer e magnet; Hall A tarc MOL MOL MOL Hall A Fo x[m] -43.57177 -43.57340 -41.03782	not truly egrees all A tar s to the MOLBO get is sh 50L TAR 1H01 50X DET Target und accel y[m] 100.021 100.021 100.022	✓ Vertical) and are tl ·get is sho Moeller S OX is the iown for r -43.57183 -43.57183 -43.57183 -43.57183 -39.25683 -39.02864 -32.95843 erator coord z[m] 97 -379.19 58 -379.19 16 -382.50	; A pos he diffication own [n Solenc detec eferen 100.02 100.02 100.02 100.02 100.02 100.02 99.50 100.02 99.50 100.02	sitive dz is erences (f ot APEX t bid; MOLT, tor box; M nce. EBAF IDEAL D ords METERS 2200 -379.1 2200 -379.1 2200 -379.1 2200 -379.1 2200 -379.1 2200 -382.5 2200 -384.8 0960 -385.1 2200 -385.1 2200 -393.0 FOUND DAT RS to target[m] 17.43436 17.43600 13.27216	arget] AR is OLDE 9945 9945 9945 9945 22285 2024 3108 7A 3108	- ideal) - id	eller ta he det pitch 0 0.00 0 0.00	Ideal. I ideal. T ideal. T arget; M ectors i degrees roll 000 0.00 000 0.00	he delta a he distant MA1H01 n the dete 00 00 00 00 00 00 00 00 00 00 00 00 00	angle ce from is the ector grees dRoll -0.00458 -0.18134 -0.01604

The downstream location of the Moller detector PMT tubes in the 'oven' box are shown below. The coordinates show the original fiducialized values of the center end of each PMT cylinder, plus the September 2012 and December 2018 as-found location relative to the respective MOLDET locations. The detector box has been adjusted and moved between the 2012 dates and the current 2018 survey. (ref data transmittals A1496 and A1652).

The coordinates are in millimeters. Movements are beam following as explained above. The ideal fiducial values are shown for reference. L1 - L4 are beam left with 1 at top, 4 at bottom. R1-R4 beam right top to bottom. Cen is the center based on the fiducialized values.

Internal PMT Ends - Millimeters in Beam Following System											
2012 fiducialized PMT tube ends				Asfound 2012 PMT locations				Asfound 2018 PMT locations			
PMT	x[mm]	y[mm]	z[mm]	PMT	x[mm]	y[mm]	z[mm]	PMT	x[mm]	y[mm]	z[mm]
L1	53.5	112.9	0.1	L1	54.2	124.0	8.5	L1	55.2	158.0	4.3
L2	53.5	37.9	0.9	L2	55.0	49.0	9.6	L2	55.9	83.0	5.4
L3	57.5	-41.4	-0.7	L3	59.7	-30.4	8.1	L3	60.6	3.7	3.9
L4	54.8	-114.8	2.4	L4	57.9	-103.8	11.5	L4	58.7	-69.7	7.2
R1	-51.4	113.7	-1.6	R1	-50.7	123.7	7.7	R1	-49.8	157.8	3.5
R2	-52.9	40.6	-0.3	R2	-51.5	50.5	9.3	R2	-50.5	84.7	5.0
R3	-58.8	-36.9	-1.8	R3	-56.6	-27.0	8.0	R3	-55.7	7.1	3.7
R4	-56.2	-111.9	1.1	R4	-53.2	-102.0	11.2	R4	-52.3	-67.8	6.9
Cen	0.0	0.0	0.0	Cen	1.8	10.5	9.3	Cen	2.7	44.6	5.0

The magnet center as-found data from 2012 to 2018 is shown below:

	ideal a	ccel coords	METERS	ideal angles degrees			
MOLPMT	x[m] y[m]		z[m]	yaw	pitch	roll	
Ideal	-39.02864	99.50960	-385.12024	142.50000	-7.30000	0.00000	

	found accel coord METERS				BFS [mm]		delta angles degrees		
MOLPMT	x[m] y[m] z[m]		dx[mm]	dy[mm]	Dz[mm]	dYaw	dPitch	dRoll	
2012	-39.02369	99.51873	-385.12963	1.79	9.13	10.46	0.50924	0.15100	0.61308
2018	-39.02434	99.5532	-385.1304	2.743	43.603	10.638	0.43679	0.19200	0.59932

Paddles

The upstream paddles RA4 and LA4 were located on January 8th, 2019. The first table below shows each of the corners for the entrance box at the upstream face of the 'oven'. These points were calculated using the intersection of the adjacent two planes and the upstream face. The second table is the location of the corners for RA4 and LA4. Refer to the sketch for their locations.

There are two sets of coordinates. Coordinates relative to the MOLTAR are based on the ideal location of MOLDET from above and along the pitched beamline. The second set of coordinates are based on the standard target location with positive Z upstream along beam.

Coordinates of corners - entrance box										
Coor	ds relativ	e to MOL	TAR	Coords relative to Target						
Corner	x[mm]	y[mm]	z[mm]	Corner	x[mm]	y[mm]	z[mm]			
bot_bl	62.6	-118.7	-904.6	bot_bl	-62.6	-515.7	10883.8			
bot_br	-63.7	-119.0	-904.3	bot_br	63.7	-516.0	10883.5			
top_bl	62.4	170.9	-941.3	top_bl	-62.4	-223.7	10883.4			
top_br	-63.5	170.9	-941.1	top_br	63.5	-223.8	10883.1			

Coordinates of paddle points and corners										
Coor	ds relativ	e to MOL	TAR	Coords relative to Target						
Point	x[mm] y[mm] z[mm]		Point	x[mm]	y[mm]	z[mm]				
RA4_crn	-49.6	-111.6	-663.8	RA4_crn	49.6	-539.2	10644.0			
RA4_br	-48.7	-111.8	-660.7	RA4_br	48.7	-539.8	10641.0			
RA4_us	-61.0	-111.8	-663.2	RA4_us	61.0	-539.4	10643.4			
RA4_t	-51.2	-7.9	-667.2	RA4_t	51.2	-435.9	10634.2			
LA4_crn	40.3	-111.5	-662.2	LA4_crn	-40.3	-539.3	10642.4			
LA4_bl	40.6	-111.7	-658.5	LA4_bl	-40.6	-540.0	10638.7			
LA4_us	53.1	-111.8	-662.2	LA4_us	-53.1	-539.6	10642.4			
LA4_t	40.8	-6.7	-666.0	LA4_t	-40.8	-434.8	10632.9			

