D0901920-v13 H1 COC Ray Coordinates
12/7/2012

ADLIGO/IFO/D0901920-v13 H1 COC Ray Coordinates_12-7-12.xlsx

Note:

1 The recycling cavity lengths are specified in Ref:T0900043-10; the ITM and ETM were moved per E1200345
2 using as-built wedge angles
3 using IO's x-coord for PR3; new y-coord and z-coord determined by wedge angles
4 using IO's x & y-coords for PR2 and PRM; new z-coord determined by wedge angles
5 using v12 y-coord for SR3; new x-coord and z-coord determined by wedge angles
6 using v12 x & y-coords for SR2 and SRM; new z-coord determined by wedge angles

	WEDGE		
	horizontal	vertical	thick side
ITMX 10?		0.0770	down
ITMY 11?		0.0760	down
ETMX		?	
ETMY		?	
CP-x 01	0.0690		-Y
CP-y 09?	0.0690		-X
BS 06	0.0760		+X, +Y
PRM3/SRM3		0.100	down
PRM2/SRM2		1.000	down
PRM/SRM		1.000	down
Schnupp Assymetry	80.0		
Schnupp correction	0		

	RAY COORDINATES, mm									
OPTIC	ZEMAX			GLOBAL			LOCAL			CHAMBER
	X	Y	Z	X	Y	Z	X	Y	Z	
ITMX-RADIUS	80.00	-200.00	5013.00	5013.0	-200.0	-80.0	433.0	-200.0	-80.0	LBSC3
ITMX-CP	80.01	-200.00	4793.00	4793.0	-200.0	-80.0	213.0	-200.0	-80.0	LBSC3
ITMX ELLIPTICAL BAF	82.40	-202.14	752.19	752.2	-202.1	-82.4	-3999247.8	-202.1	-82.4	LBSC2
BSAR ELLIPTICAL BAF	82.91	-202.59	-92.31	-92.3	-202.6	-82.9	20029.7	-202.6	-82.9	LBSC2
BS AR	82.93	-202.62	-136.62	-136.6	-202.6	-82.9	-136.6	-202.6	-82.9	LBSC2
PR3	94.78	-173.95	-19740.50	-19740.5	-174.0	-94.8	381.5	-174.0	-94.8	LHAM2
PR2	84.53	-530.38	-3581.69	-3581.7	-530.4	-84.5	249.3	-530.4	-84.5	LHAM3
PRM	95.80	-628.00	-20194.31	-20194.3	-628.0	-95.8	-72.3	-628.0	-95.8	LHAM2
ITMY-RADIUS	80.00	4983.10	-200.00	-200.0	4983.1	-80.0	-200.0	403.1	-80.0	LBSC1
ITMY-CP	80.01	4763.10	-200.00	-200.0	4763.1	-80.0	-200.0	183.1	-80.0	LBSC1
ITMY ELLIPTICAL BAF	82.35	751.80	-202.12	-202.1	751.8	-82.3	-202.1	-3828.2	-82.3	LBSC2
BSHR ELLIPTICAL BAF	82.88	-141.46	-202.60	-202.6	-141.5	-82.9	22489.4	-141.5	-82.9	LBSC2
BS HR	82.91	-183.89	-202.63	-202.6	-183.9	-82.9	-202.6	-183.9	-82.9	LBSC2
BS ARS	82.93	-249.82	-183.99	-184.0	-249.8	-82.9	-184.0	-249.8	-82.9	LBSC2
SR3	94.49	-19615.89	-174.22	-174.2	-19615.9	-94.5	-174.2	506.1	-94.5	LHAM5
SR2	104.36	-4178.10	-594.10	-594.1	-4178.1	-104.4	-594.1	-347.1	-104.4	LHAM4
SRM	113.22	-19908.58	305.40	305.4	-19908.6	-113.2	305.4	213.4	-113.2	LHAM5
OUTPUT FARADAY IN	117.19	-20474.11	337.61	337.6	-20474.1	-117.2	337.6	-352.1	-117.2	LHAM5
OUTPUT FARADAY OUT	117.45	-20976.89	362.27	362.3	-20976.9	-117.4	362.3	-854.9	-117.4	LHAM5
ISC STEERING MIRROR	118.75	-23317.00	507.63	507.6	-23317.0	-118.8	507.6	-625.0	-118.8	LHAM6
ETMX	80.0	-200.0	3999498.0	3999498.0	-200.0	-80.0	-502.0	-200.0	-80.0	LBSC9
ETMY	80.0	3999468.1	-200.0	-200.0	3999468.1	-80.0	-200.0	-531.9	-80.0	LBSC10

		ZEMAX			GLOBAL			GLOBAL		
OPTIC	**CHAMBER**	**INCIDENT RAY VECTOR COSINES**			**INCIDENT RAY VECTOR COSINES**			**INCIDENT RAY VECTOR ANGLES, deg**		
		X	**Y**	**Z**	**X**	**Y**	**Z**	**X**	**Y**	**Z**
ITMX-RADIUS	LBSC3	0.000000	0.000000	-1.000000	-1.000000	0.000000	0.000000	180.00		0.000
ITMX-CP	LBSC3	0.000605	0.000000	-1.000000	-1.000000	0.000000	-0.000605	180.00		-0.035
ITMX ELLIPTICAL BAF	LBSC2	0.000605	-0.000542	-1.000000	-1.000000	-0.000542	-0.000605	180.03		-0.035
BSAR ELLIPTICAL BAF	LBSC2	0.000605	-0.000542	-1.000000	-1.000000	-0.000542	-0.000605	180.03		-0.035
BS AR	LBSC2	0.000605	-0.000542	-1.000000	-1.000000	-0.000542	-0.000605	180.03		-0.035
PR3	LHAM2	0.000605	0.000508	-1.000000	-1.000000	0.000508	-0.000605	179.97		-0.035
PR2	LHAM3	-0.000634	-0.022059	0.999756	0.999756	-0.022059	0.000634	-1.26		0.036
PRM	LHAM2	0.000680	-0.005865	-0.999983	-0.999983	-0.005865	-0.000680	180.34		-0.039
ITMY-RADIUS	LBSC1	0.000000	-1.000000	0.000000	0.000000	-1.000000	0.000000		180.00	0.000
ITMY-CP	LBSC1	0.000597	-1.000000	0.000000	0.000000	-1.000000	-0.000597		180.00	-0.034
ITMY ELLIPTICAL BAF	LBSC2	0.000597	-1.000000	-0.000542	-0.000542	-1.000000	-0.000597		179.97	-0.034
BSHR ELLIPTICAL BAF	LBSC2	0.000597	-1.000000	-0.000542	-0.000542	-1.000000	-0.000597		179.97	-0.034
BS HR	LBSC2	0.000597	-1.000000	-0.000542	-0.000542	-1.000000	-0.000597		179.9689	-0.034
BS ARS	LBSC2	internal ray								
SR3	LHAM4	0.000597	-1.000000	0.000504	0.000504	-1.000000	-0.000597		180.03	-0.034
SR2	LHAM5	0.000639	0.999630	-0.027191	-0.027191	0.999630	-0.000639		1.56	-0.037
SRM	LHAM5	0.000562	-0.998369	0.057086	0.057086	-0.998369	-0.000562		183.27	-0.032
OUTPUT FARADAY IN	LHAM5	0.000558	-0.998369	0.057085	0.057085	-0.998369	-0.000558		183.27	-0.032
OUTPUT FARADAY OUT	LBSC9	0.000558	-0.997746	0.067103	0.067103	-0.997746	-0.000558		183.85	-0.032
ISC STEERING MIRROR	LHAM6	0.000558	-0.998125	0.061199	0.061199	-0.998125	-0.000558		183.51	-0.032
ETMX	LBSC9									
ETMY	LBSC10									

	CAVITY LENGTH									
	ACTUAL	**DESIGN**	**DIFF**							
AC length	3994485.0	3994485.0	0.0							
PRC length	57656.45	57656.00	-0.5							
SRC length	56008.02	56008.00	0.0							
Arm Cavity X length	3994485.0	3994485.0	0.0							
Arm Cavity Y length	3994485.0	3994485.0	0.0							
Schnupp Assymmetry	80	80	0.0							
n (1064nm)	1.44963									
					GLOBAL					
CHAMBER										
LBSC1				0.0	4580.0	0.0				
LBSC2				0.0	0.0	0.0				
LBSC3				4580.0	0.0	0.0				
LBSC9				4000000.0	0.0	0.0				
LBSC10				0.0	4000000.0	0.0				
LHAM1				-22692.0	0.0	0.0				
LHAM2				-20122.0	0.0	0.0				
LHAM3				-3831.0	0.0	0.0				
LHAM4				0.0	-3831.0	0.0				
LHAM5				0.0	-20122.0	0.0				
LHAM6				0.0	-22692.0	0.0				

z	x	y	Comment	distance	index	optical path	average length	Schnupp	design length
ACTUAL SPACING									
POWER RECYCLING CAVITY									
				Y-ARM					
-80.0	-200.0	3999468.1	ETMY						
-80.0	-200.0	4983.1	ITMY-RADIUS			0.0			
-80.0	-200.0	4883.1	ITMY-RADIUS	100.0	1.44963	145.0			
-80.0	-200.0	4783.1	ITMY-RADIUS	100.0	1.44963	145.0			
-80.0	-200.0	4763.1	ITMY-CP	20.0	1.000	20.0			
-80.0	-200.0	4663.1	ITMY-CP	100.0	1.44963	145.0			
-82.9	-202.6	-183.9	BSHR	4847.0	1.000	4847.0			
-94.8	-19740.5	-174.0	PRM3	19537.9	1.000	19537.9			
-84.5	-3581.7	-530.4	PRM2	16162.7	1.000	16162.7			
-95.8	-20194.3	-628.0	PRM	16612.9	1.000	16612.9			
						57615.4			
				X-ARM					
-80.0	3999498.0	-200.0	ETMX						
-80.0	5013.0	-200.0	ITMX-RADIUS			0.0			
-80.0	4913.0	-200.0	ITMX-RADIUS	100.0	1.44963	145.0			
-80.0	4813.0	-200.0	ITMX-RADIUS	100.0	1.44963	145.0			
-80.0	4793.0	-200.0	ITMX-CP	20.0	1.000	20.0			
-80.0	4693.0	-200.0	ITMX-CP	100.0	1.44963	145.0			
-82.9	-136.6	-202.6	BS AR	4829.6	1.000	4829.6			
-82.9	-202.6	-183.9	BSHR	68.6	1.44963	99.5			
-94.8	-19740.5	-174.0	PRM3	19537.9	1.000	19537.9			
-84.5	-3581.7	-530.4	PRM2	16162.7	1.000	16162.7			
-95.8	-20194.3	-628.0	PRM	16612.9	1.000	16612.9			
						57697.5	**57656.5**	**82.1**	

z	x	y	Comment	distance	index	optical path	average length	Schnupp	design length
z	x	y	Comment	distance	index	optical path	average length	Schnupp	design length
ACTUAL SPACING									
SIGNAL RECYCLING CAVITY									
				Y-ARM					
-80.0	-200.0	4983.1	ITMY-RADIUS			0.0			
-80.0	-200.0	4883.1	ITMY-RADIUS	100.0	1.44963	145.0			
-80.0	-200.0	4783.1	ITMY-RADIUS	100.0	1.44963	145.0			
-80.0	-200.0	4763.1	ITMY-CP	20.0	1.000	20.0			
-80.0	-200.0	4663.1	ITMY-CP	100.0	1.44963	145.0			
-82.9	-202.6	-183.9	BSHR	4847.0	1.000	4847.0			
-82.9	-184.0	-249.8	BS ARS	68.5	1.44963	99.3			
-94.5	-174.2	-19615.9	SRM3	19366.1	1.000	19366.1			
-104.4	-594.1	-4178.1	SRM2	15443.5	1.000	15443.5			
-113.2	305.4	-19908.6	SRM	15756.2	1.000	15756.2			
						55967.0			
				X-ARM					
-80.0	5013.0	-200.0	ITMX-RADIUS	0.0	1.44963	0.0			
-80.0	4913.0	-200.0	ITMX-RADIUS	100.0	1.44963	145.0			
-80.0	4813.0	-200.0	ITMX-RADIUS	100.0	1.44963	145.0			
-80.0	4793.0	-200.0	ITMX-CP	20.0	1.000	20.0			
-80.0	4693.0	-200.0	ITMX-CP	100.0	1.44963	145.0			
-82.9	-136.6	-202.6	BS AR	4829.6	1.000	4829.6			
-82.9	-202.6	-183.9	BSHR	68.6	1.44963	99.5			
-82.9	-184.0	-249.8	BSARS	68.5	1.44963	99.3			
-94.5	-174.2	-19615.9	SRM3	19366.1	1.000	19366.1			
-104.4	-594.1	-4178.1	SRM2	15443.5	1.000	15443.5			
-113.2	305.4	-19908.6	SRM	15756.2	1.000	15756.2			
						56049.1	**56008.0**	**82**	