E1101146-v2 L1 RECYCLING CAVITY LENGTH
1/19/2012

ADLIGO/IFO/E1101146-v2 L1_recycling-cavity-length_v4_0.076wedge.xls

	WEDGE		
	horizontal	vertical	thick side
ITM/ETM		0.076	down
CP-x	0.069		-Y
CP-y	0.069		-X
BS	0.074		right
PRM3/SRM3		0.10	down
PRM2/SRM2		1.00	down
PRM/SRM		1.00	down
Schnupp Assymetry	50.0		
Schnupp correction	0		

	COORDINATES, mm									
OPTIC	**ZEMAX**			**GLOBAL**			**LOCAL**			**CHAMBER**
	X	**Y**	**Z**	**X**	**Y**	**Z**	**X**	**Y**	**Z**	
ITMX-RADIUS	80.00	-200.00	4998.00	4998.0	-200.0	-80.0	418.0	-200.0	-80.0	LBSC3
ITMX-CP	80.01	-200.00	4778.00	4778.0	-200.0	-80.0	198.0	-200.0	-80.0	LBSC3
BS AR	82.89	-202.61	-139.35	-139.4	-202.6	-82.9	-139.4	-202.6	-82.9	LBSC2
BS HR	82.91	-184.65	-202.65	-202.6	-184.6	-82.9	-202.6	-184.6	-82.9	LBSC2
PR3	94.58	-175.26	-19741.00	-19741.0	-175.3	-94.6	381.0	-175.3	-94.6	LHAM2
PR2	94.14	-530.36	-3589.10	-3589.1	-530.4	-94.1	241.9	-530.4	-94.1	LHAM3
PRM	104.06	-627.67	-20208.00	-20208.0	-627.7	-104.1	-86.0	-627.7	-104.1	LHAM2
ITMY-RADIUS	80.00	4998.10	-200.00	-200.0	4998.1	-80.0	-200.0	418.1	-80.0	LBSC1
ITMY-CP	80.01	4778.10	-200.00	-200.0	4778.1	-80.0	-200.0	198.1	-80.0	LBSC1
BS ARS	82.94	-247.86	-184.76	-184.8	-247.9	-82.9	-184.8	-247.9	-82.9	LBSC2
SR3	94.50	-19615.90	-175.54	-175.5	-19615.9	-94.5	-175.5	506.1	-94.5	LHAM5
SR2	84.85	-4160.41	-594.25	-594.3	-4160.4	-84.8	-594.3	-329.4	-84.8	LHAM4
SRM	94.24	-19875.60	305.20	305.2	-19875.6	-94.2	305.2	246.4	-94.2	LHAM5
OUTPUT FARADAY IN	97.7	-20363.0	333.0	333.0	-20363.0	-97.7	333.0	-241.0	-97.7	LHAM5
OUTPUT FARADAY OUT	98.2	-20912.3	360.7	360.7	-20912.3	-98.2	360.7	-17081.3	-98.2	LHAM5
OMC	99.3	-22685.0	470.5	470.5	-22685.0	-99.3	470.5	-18854.0	-99.3	LHAM6
ETMX	80.0	-200.0	3999498.0	3999498.0	-200.0	-80.0	-502.0	-200.0	-80.0	LBSC4
ETMY	80.0	3999498.1	-200.0	-200.0	3999498.1	-80.0	-200.0	-501.9	-80.0	LBSC5

		GLOBAL			GLOBAL					
OPTIC	**CHAMBER**	**RAY VECTOR COSINES**			**RAY VECTOR ANGLES, deg**					
		X	**Y**	**Z**	**X**	**Y**	**Z**			
ITMX-RADIUS	LBSC3	-1.000000	0.000000	0.000000	0.000	90.000	0.000			
ITMX-CP	LBSC3	-1.000000	0.000000	-0.000597	0.000	90.000	-0.034			
BS AR	LBSC2	-0.9999997	-0.000541963	-0.000596945	0.031	89.969	-0.034			
BS HR	LBSC2	-0.000542	-1.000000	-0.000597	89.969	0.031	-0.034			
PR3	LHAM2	-0.9999997	0.00048064	-0.000596945	-0.028	-89.972	-0.034			
PR2	LHAM3	0.99975842	-0.021980599	2.70417E-05	-1.259	-88.741	0.002			
PRM	LHAM2	-0.99998266	-0.005860973	-0.000597521	0.336	89.664	-0.034			
ITMY-RADIUS	LBSC1	0.0	-1.0	0.0	90.000	0.000	0.000			
ITMY-CP	LBSC1	0.0	-1.0	0.0	90.000	0.000	-0.034			
BS ARS	LBSC2	N/A INTERNAL REFLECTION								
SR3	LHAM5	0.000477	-1.000000	-0.000597	90.027	-0.027	-0.034			
SR2	LHAM4	-0.027083	0.999633	0.000625	91.552	-1.552	0.036			
SRM	LHAM5	0.057138	-0.998366	-0.000594	93.276	-3.276	-0.034			
OUTPUT FARADAY IN	LHAM5	0.057140	-0.998330	-0.008454	93.276	-3.276	-0.484			
OUTPUT FARADAY OUT	LHAM5	0.067162	-0.997742	-0.000598	93.851	-3.851	-0.034			
OMC	LHAM6	0.059314	-0.998239	-0.000598	93.400	-3.400	-0.034			
ETMX	LBSC9									
ETMY	LBSC10									

Note: The following recycling cavity lengths are based upon an arm cavity length = 3994500 mm, Ref:T0900043-10

	CAVITY LENGTH		
	ACTUAL	**DESIGN**	**DIFF**
AC length	3994500.0	3994500.0	0.0
PRC length	57655.98	57656.00	0.0
SRC length	56008.03	56008.00	0.0
Arm Cavity X length	3994500.0	3994500.0	0.0
Arm Cavity Y length	3994500.0	3994500.0	0.0
Schnupp Assymmetry	50	50	0.0
n	1.44963		

	GLOBAL		
CHAMBER	**X**	**Y**	**Z**
LBSC1	0.0	4580.0	0.0
LBSC2	0.0	0.0	0.0
LBSC3	4580.0	0.0	0.0
LBSC4	4000000.0	0.0	0.0
LBSC5	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	3999498.1	ETMY						
-80.0	-200.0	4998.1	ITMY-RADIUS			0.0			
-80.0	-200.0	4898.1	ITMY-RADIUS	100.0	1.44963	145.0			
-80.0	-200.0	4798.1	ITMY-RADIUS	100.0	1.44963	145.0			
-80.0	-200.0	4778.1	ITMY-CP	20.0	1.000	20.0			
-80.0	-200.0	4678.1	ITMY-CP	100.0	1.44963	145.0			
-82.9	-202.6	-184.6	BSHR	4862.8	1.000	4862.8			
-94.6	-19741.0	-175.3	PRM3	19538.4	1.000	19538.4			
-94.1	-3589.1	-530.4	PRM2	16155.8	1.000	16155.8			
-104.1	-20208.0	-627.7	PRM	16619.2	1.000	16619.2			
						57631.0			
				X-ARM					
-80.0	3999498.0	-200.0	ETMX						
-80.0	4998.0	-200.0	ITMX-RADIUS			0.0			
-80.0	4898.0	-200.0	ITMX-RADIUS	100.0	1.44963	145.0			
-80.0	4798.0	-200.0	ITMX-RADIUS	100.0	1.44963	145.0			
-80.0	4778.0	-200.0	ITMX-CP	20.0	1.000	20.0			
-80.0	4678.0	-200.0	ITMX-CP	100.0	1.44963	145.0			
-82.9	-139.4	-202.6	BS AR	4817.4	1.000	4817.4			
-82.9	-202.6	-184.6	BSHR	65.8	1.44963	95.4			
-94.6	-19741.0	-175.3	PRM3	19538.4	1.000	19538.4			
-94.1	-3589.1	-530.4	PRM2	16155.8	1.000	16155.8			
-104.1	-20208.0	-627.7	PRM	16619.2	1.000	16619.2			
						57681.0	**57656.0**	**50.0**	

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	4998.1	ITMY-RADIUS			0.0			
-80.0	-200.0	4898.1	ITMY-RADIUS	100.0	1.44963	145.0			
-80.0	-200.0	4798.1	ITMY-RADIUS	100.0	1.44963	145.0			
-80.0	-200.0	4778.1	ITMY-CP	20.0	1.000	20.0			
-80.0	-200.0	4678.1	ITMY-CP	100.0	1.44963	145.0			
-80.0	-202.6	-184.6	BSHR	4862.8	1.000	4862.8			
-82.9	-184.8	-247.9	BS ARS	65.8	1.44963	95.3			
-94.5	-175.5	-19615.9	SRM3	19368.0	1.000	19368.0			
-84.8	-594.3	-4160.4	SRM2	15461.2	1.000	15461.2			
-94.2	305.2	-19875.6	SRM	15740.9	1.000	15740.9			
						55983.1			
				X-ARM					
-80.0	4998.0	-200.0	ITMX-RADIUS	0.0	1.44963	0.0			
-80.0	4898.0	-200.0	ITMX-RADIUS	100.0	1.44963	145.0			
-80.0	4798.0	-200.0	ITMX-RADIUS	100.0	1.44963	145.0			
-80.0	4778.0	-200.0	ITMX-CP	20.0	1.000	20.0			
-80.0	4678.0	-200.0	ITMX-CP	100.0	1.44963	145.0			
-82.9	-139.4	-202.6	BS AR	4817.4	1.000	4817.4			
-82.9	-202.6	-184.6	BSHR	65.8	1.44963	95.4			
-82.9	-184.8	-247.9	BSARS	65.7	1.44963	95.2			
-94.5	-175.5	-19615.9	SRM3	19368.0	1.000	19368.0			
-84.8	-594.3	-4160.4	SRM2	15461.2	1.000	15461.2			
-94.2	305.2	-19875.6	SRM	15740.9	1.000	15740.9			
						56033.0	**56008.0**	**50**	