

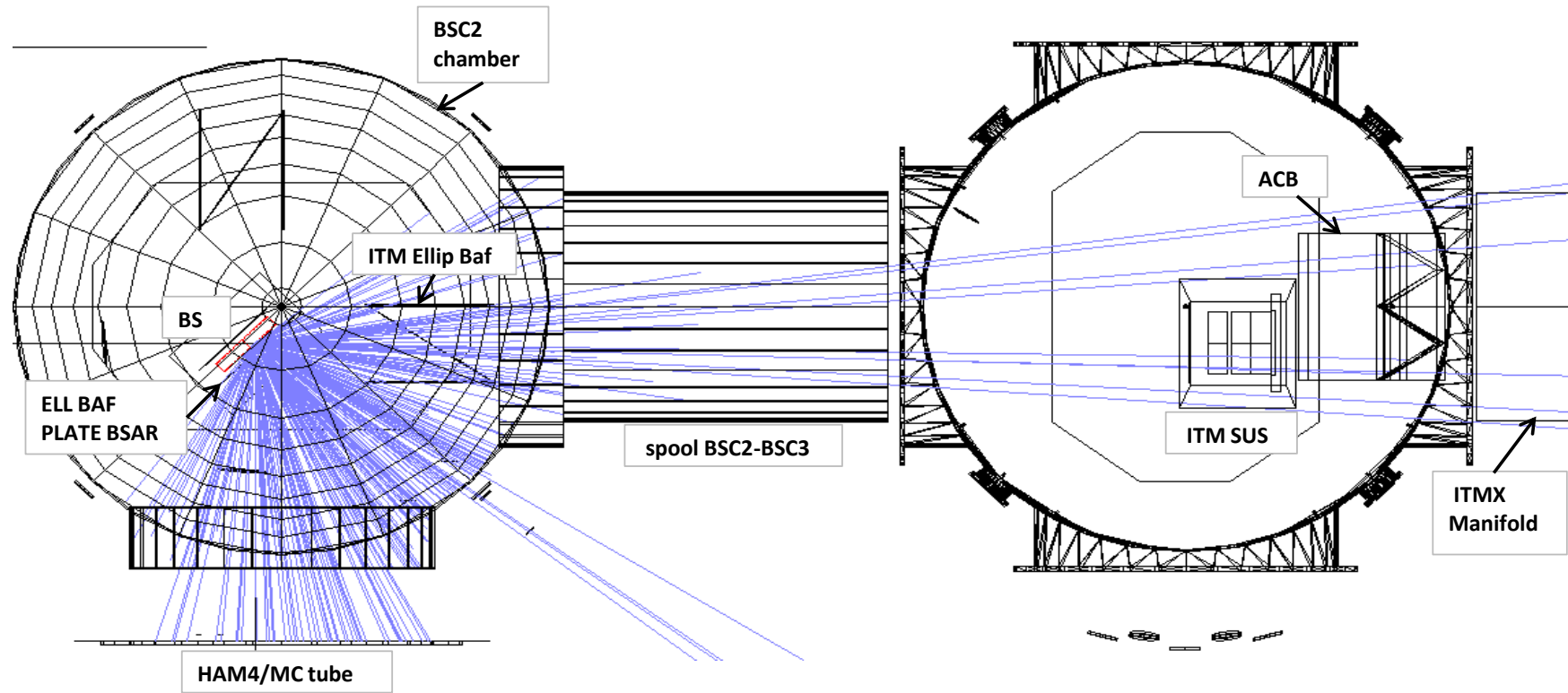
T1300539 BS wide-angle Scatter Displacement Noise Summary

Detector Viewer Summary

File : H:\ADLIGO\SLC\Scattering BS\_6-10-13.ZMX

Title : D0901920-v4, Advanced LIGO, H1 Layout

Date : 6/11/2013



Incoherent Data

Surface	Power, W	fractional scatter	ZEMAX coordinate			scattering length, mm	incident angle, deg	incident angle, rad
			x	y	z			
Recycling Cavity Power	2.84E+03							
Scatter Loss Fraction	1.00E-05							
BS			82.91	-202.6	-136.6			
Total Analysis Power Reference	1000							
1015: BS Scatter Detector	999.3	0.9993						
1016: BSC2 cylinder	737.6	0.7376						
1021: BSC top	57.1	0.0571						
1022: BSC bottom	160.8	0.1608						
1023: BSC2 cyl exit +X	108.0	0.1080						
1024: BSC2 cyl exit -Y	321.9	0.3219						
999: ELL BAF PLATE1	0.2	0.0002	83	-203	750	887	45	0.79
1002: ELL BAF PLATE2 ITMX	0.3	0.0003	83	9	750	912	58	1.02
1003: ELL BAF PLATE3 ITMX	23.0	0.0230	83	-416	750	912	59	1.02
total Ellip Baf ITMX	23.4	0.0234						
994: ELL BAF PLATE BSAR	0.5	0.0005	83	-130	-17	140	76	1.33
1017: BSC spool +X	40.4	0.0404	0	776	1250	1699	-10	-0.17
1018: BSC flange +X	25.5	0.0255	0	692	1425	1802	-15	-0.26
1025: spool BSC2-BSC3	29.2	0.0292	0	620	2231	2508	-26	-0.45
1026: BSC3 opening	11.5	0.0115						
check total exit +X	106.7	0.9877						
1019: BSC spool -Y	97.2	0.0972	83	-1279	764	1403	5	0.09
1020: BSC flange -Y	57.9	0.0579	83	-1420	600	1423	14	0.24
373: BS Chamber HAM4 block	152.1	0.1521						
check total exit -Y	307.2	0.9542						
BSC2 cylinder	323.7	0.3237	83	-1063	814	1282	-3	-0.05
BSC top	57.1	0.0571	1407	-203	957	1717	50	0.88
BSC bottom	160.8	0.1608	-879	-203	1010	1497	40	0.70
total BSC2 chamber	541.6	0.5416						

check total power	979.3	0.9793						
total hitting HAM4/MC tube	152.1	0.1521	83	-1835	845	1905	14	0.24
1028: ITM upper envelope	0.0	0.0000						
1029: ITM middle envelope	4.1	0.0041	83	-184	4577	4714	-44.8	-0.78
1030: ITM lower envelope	0.0	0.0000						
1031: SUS ring around TM	0.6	0.0006	-127	-268	4597	4739	-42	-0.74
total ITM SUS	4.6	0.0046				258	58	1.01
1047: ARM CAVITY BAF PLATE 6 ITMX	1.1	0.0011	-72	300	5710	5870	-40	-0.70
1051: WIDE ANGLE BAF BOTTOM LEDGE ITMX	0.1	0.0001	290	387	5717	5887	-39	-0.68
1052: acb_wide-angle-baffle-side_H1_ITMx.POB	0.2	0.0002	3.8	400	5730	5898	-39	-0.68
total ACB	1.4	0.0014						
1027: ITMX Manifold	5.4	0.0054	-225	535	7116	7297	-39	-0.68
check total entering BSC3	11.4	0.9914						

### SCATTERED LIGHT SUMMARY

Ref: see BS\_wide-angle\_scatter\_ZEMAX.xmcd for the Displacement Noise Calculations

Surface	Incident Power, W	Power Scattered into IFO, W	BRDF, sr <sup>-1</sup>	Motion Spectrum, m/rtHz	Displacement Noise, m/rtHz
TOTAL ITM ELL BAF	6.66E-04	4.56E-23	0.03	1.00E-12	2.26E-28
BSAR ELL BAF PLATE	1.42E-05	1.87E-23	0.03	3.00E-14	4.33E-30
TOTAL BSC2	1.54E-02	2.18E-21	0.1	8.00E-11	1.25E-25
HAM4/MC TUBE	4.33E-03	4.17E-22	0.1	8.00E-11	7.70E-26
TOTAL ITM SUS FRAME	1.32E-04	4.64E-25	1	3.00E-14	3.94E-30
TOTAL WIDE ANGLE ITM ACB	4.08E-05	9.57E-26	0.03	1.00E-12	1.03E-29