

H1 Interferometer Resonances

Use these quick links to go directly to the desired H1 subsystem:

Beamsplitter, ITMs, ETMs, Recycling Mirror, MMT3 Mirror, Small Optic Suspensions, Optical Levers, Violin Modes, Magnet Standoff Assembly, PSL Periscope Resonances, HAM, BSC, LHO References

Beamsplitter (BS) Resonances (H1)

INTERNAL RESONANCES					
Description	f_{th}(Hz)	f_{meas}(Hz)	Q_{th}	Q_{meas}	References
PENDULAR RESONANCES					
Unknown		9.648			-/34/-/-
Unknown		5.402			-/34/-/-
Unknown		2.293			-/34/-/-
pendular	.744	.758			3/34/-/-
sideways pendular		.738			-/34/-/-
pitch	.600	.609			3/34/-/-
yaw	.500	.469			3/34/-/-
vertical "bounce"	~12.8	12.629			-/34/-/-
roll	~18.1	17.418			10/34/-/-
violin	223	329.514, 329.586, 329.775			3/31/-/-
INTERNAL RESONANCES					

butterfly	3785	3731.92			1/24/-/-
butterfly	3785				1/-/-/-
drum head	5578	5478.34			1/24/-/-
3-fold-radial	7975		1.3x10 ⁶		1/2/1/2
3-fold-radial	7975	7802.25			1/-/-/-
	11259	11133.76			1/24/-/-
	11332	11134.39			1/24/-/-
	11334				1/-/-/-
	12674				1/-/-/-
	12677				1/-/-/-
	12760				1/-/-/-
	12760				1/-/-/-
	14629				1/-/-/-
	17283				1/-/-/-
	17283				1/-/-/-
	17388				1/-/-/-
	17388				1/-/-/-
	17958				1/-/-/-
	17958				1/-/-/-

Input Test Mass (ITM) Resonances (H1)

H1 ITM_x

Description	f _{th} (Hz)	f _{meas} (Hz)	Q _{th}	Q _{meas}	References
PENDULAR RESONANCES					

Unknown		19.625			-/34/-/-
Unknown		9.648			-/34/-/-
Unknown		5.402			-/34/-/-
pendular	.743	.762			3/34/-/-
sideways pendular		.734			-/34/-/-
pitch	.600	.617			3/34/-/-
yaw	.499	.500			3/34/-/-
vertical (bounce)	12.72	11.891			3/34/-/-
vertical (roll)		17.430			-/34/-/-
violin	339	347.474, 347.271			3/33/-/-
INTERNAL RESONANCES					3
butterfly					
drumhead (aliased)					
drumhead (un-aliased)					
breathing					
		37804.5 +/-0.5		1.03x10 ⁵	-/27/-/27
		37971.7 +/-0.5		1.00x10 ⁴	-/27/-/27

H1 ITMy

Description	f _{th} (Hz)	f _{meas} (Hz)	Q _{th}	Q _{meas}	References
PENDULAR RESONANCES					
Unknown		5.406			-/34/-/-
Unknown		9.562			-/34/-/-

pendular	.743	.762			3/34/-/-
sideways pendular		.734			-/34/-/-
pitch	.600	.621			3/34/-/-
yaw	.499	.504			3/34/-/-
vertical (bounce)	12.72	11.887			3/34/-/-
vertical (roll)		17.438			-/34/-/-
violin	339	347.689, 347.714			3/33/-/-
INTERNAL RESONANCES					3
(measured mode)					-/24/-/-
(measured mode)					-/24/-/-
butterfly					
drumhead (aliased)					
drumhead (un-aliased)					
breathing					

End Test Mass (ETM) Resonances (H1)

H1 ETM_x

Description	f_{th} (Hz)	f_{meas} (Hz)	Q_{th}	Q_{meas}	References
PENDULAR RESONANCES					
Unknown		20.453			-/34/-/-
Unknown		17.895			-/34/-/-
Unknown		5.113			-/34/-/-
pendular	.744	.758			3/34/-/-

sideways pendular		.734			-/38/-/-
pitch	.600	.613			3/34/-/-
yaw	.500	.508			3/38/-/-
vertical (bounce)	12.85	12.012			3/34/-/-
vertical (roll)		17.637			-/34/-/-
violin	336	343.541			3/37/-/-
INTERNAL RESONANCES					
(measured mode)					
(measured mode)					
butterfly	6596	6615.38			4/24/-/-
butterfly	6596				4/-/-/-
drumhead (aliased)		7161.69 (freq deviation of $\pm 1 \times 10^{-5}$)			-/28/-/-
drumhead (un-aliased)	9206	9222.31			4/28/-/-
	11217	11195			4/24/-/-
	11217				4/-/-/-
	12056				4/-/-/-
	12057	12184			4/-/24/-
	12941				4/-/-/-
	12943				4/-/-/-
longitudinal	14475				4/-/-/-

H1 ETMy

Description	f_{th} (Hz)	f_{meas} (Hz)	Q_{th}	Q_{meas}	References
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PENDULAR RESONANCES					
Unknown		18.246			-/34/-/-
Unknown		7.820			-/34/-/-
Unknown		5.211			-/34/-/-
pendular	.744	.766			3/34/-/-
sideways pendular		.734			3/34/-/-
pitch	.600	.633			3/34/-/-
yaw	.500	.500			3/34/-/-
vertical (bounce)	12.85	12.000			3/34/-/-
vertical (roll)		17.613			3/34/-/-
violin	336	344.819, 344.825			3/36/-/-
INTERNAL RESONANCES					
(measured mode)					-/24/-/24
(measured mode)					-/24/-/24
butterfly	6596				4/24/-/-
butterfly	6596				4/-/-/-
drumhead (aliased)		7154.92 (freq deviation of $\pm 1 \times 10^{-5}$)			-/28/-/-
drumhead (un-aliased)	9206	9229.08			4/28/-/-
	11217				4/24/-/-
	11217				4/-/-/-
	12056				4/-/-/-
	12057				4/-/24/-
	12941				4/-/-/-

	12943				4/-/-
longitudinal	14475				4/-/-

Recycling Mirror (RM) Resonances (H1)

Description	f_{th} (Hz)	f_{meas} (Hz)	Q_{th}	Q_{meas}	References
PENDULAR RESONANCES					
Unknown		9.648			-/34/-
Unknown		5.402			-/34/-
Unknown		2.293			-/34/-
pendular	.741	.758			3/34/-
sideways pendular		.730			3/34/-
pitch	.600	.621			3/34/-
yaw	.501	.508			3/34/-
vertical (bounce)	12.86	12.418			3/34/-
vertical (roll)		17.977			-/34/-
violin	334				3/21/-
INTERNAL RESONANCES					

MMT3 Mirror (MMT3) Resonances (H1)

Description	f_{th} (Hz)	f_{meas} (Hz)	Q_{th}	Q_{meas}	References
PENDULAR RESONANCES					
pendular		.758			-/35/-

sideways pendular		.733			-/26/-/-
pitch		.617			-/35/-/-
yaw		.500			-/35/-/-
vertical (bounce)					-/-/-/-
vertical (roll)					-/-/-/-
violin					-/-/-/-
INTERNAL RESONANCES					

Small Optic Suspension (SOS) Resonances (H1)

Description	f_{th} (Hz)	f_{meas} (Hz)	Q_{th}	Q_{meas}	References
Description	f_{th} (Hz)	f_{meas} (Hz)	Q_{th}	Q_{meas}	References
ASSOCIATED RESONANCES					
Dumbbell Assembly		9700		130	-/15/-/-
Suspension Support Structure		156			-/15/-/-
PENDULAR RESONANCES					
mc1					
pendular	1.0	.977			15/35/-/-
sideways pendular		1.000			-/26/-/-
pitch	.75	.727			15/35/-/-
yaw	.85	.836			15/35/-/-
vertical (bounce)		16.258			-/35/-/-
mc2					
pendular	1.0	.984			15/35/-/-

sideways pendular		.999			-/26/-/-
pitch	.75	.766			15/35/-/-
yaw	.85	.813			15/35/-/-
vertical (bounce)		19.180			-/35/-/-
mc3					
pendular	1.0	.984			15/35/-/-
sideways pendular		.999			-/26/-/-
pitch	.75	.695			15/35/-/-
yaw	.85	.789			15/35/-/-
vertical (bounce)		19.320			-/35/-/-
mmt1					
pendular	1.0	.992			15/35/-/-
sideways pendular		.989			-/26/-/-
pitch	.75	.773			15/35/-/-
yaw	.85	.852			15/35/-/-
vertical (bounce)		19.320			-/35/-/-
mmt2					
pendular	1.0	.992			15/35/-/-
sideways pendular		1.007			-/26/-/-
pitch	.75	.797			15/35/-/-
yaw	.85	.852			15/35/-/-
vertical (bounce)		19.391			-/35/-/-
sm					
pendular	1.0	1.000			15/35/-/-
sideways pendular		.993			-/26/-/-

pitch	.75	.875			15/35/-/-
yaw	.85	.828			15/35/-/-
vertical (bounce)		19.352			-/35/-/-
vertical	16.0	14.75			15/13/-/-
roll					-/-/-/-
violin1		708.30		2.2×10^5	-/13/-/13
violin2		1416.34		6.7×10^5	-/13/-/13

Optical Lever Resonances (H1)

Location	frequency(Hz)	FWHM	References (date of measurement)
MMT3	12.6,44.1,88.5,133,143,221,233	1,<.1,<.1,<.1,7,1,2	22/22 (July 24, 2003)
RM	9.9,12.6,37.4	2, 1.5	22/22(July 23, 2003)
BS	18.6,100.7,153,218.3,328	_,2,2,2,1	22/22 (July 29, 2003)
ITMx	17.8,25.6,47.8,154,185.6	2.3,2.7,1.2,5,1.8	22/22 (July 22, 2003)
ITMy	27.9,35.2,41.9,266.3,269.1,313.9	1.5,1.6,2.4,1.3,1.8,1.6	22/22 (July 23,2003)
ETMx	24.1,29.6,45.1,69.5,94.6,139.8,146.1,170.5	2.5,2,2.2,3,3,1.6,_,1.7	22/22 (July 23,2003)
ETMy	24.8,28,51,63.5,107.5,200.5,477	2,2.5,3,3,2,2,1	22/22(July 23,2003)

Violin Mode Resonances (H1)

Frequency	Q Value	Sources	References
223		Beamsplitter Pendular Resonance (H2 & H1)	3

334		RM Pendular Resonance (H1)	3
335.82		RM?	eelog: 1/21/2002
336.062		ETM _x	eelog: 4/19/2002
339		ITM Pendular Resonances (H1)	3
339.72		ETM _y	eelog: 4/19/2002
343		BS, SM, MMT1_LR, MC2_LR, ITM _y ?	eelog: 8/27/2002
343.413		ETM _x	eelog: 12/3/2002
343.4152	8.806e4	BS, MC3_LL, MMT1	23
343.4156	1.141e5		eelog: 8/12/2002
343.42		ETM _x	eelog: 12/2/2002
343.93		ITM _x , RM, MC2_LR?	eelog: 2/5/2002
343.94		ETM _x	eelog: 12/2/2002
344.06		ETM _x	eelog: 12/2/2002
344.0608	10.752e4	ITM _y ?	23
344.0609	1.022e5		eelog: 8/12
344.7156	21.545e4		23
344.7162	1.242e5		eelog: 8/12
344.8299	9.579e4	MMT1_LL,MMT_LR,RM?	23
344.8302	1.437e5		eelog: 8/12
347.17		ITM _x	eelog: 12/2/2002
347.1790	13.353e4	BS, ETM _x ?	23
347.1798	1.551e5		eelog: 8/12
347.27		ITM _x	eelog: 12/2/2002
347.2719	23.151e4	RM,MMT2_LL?	23
347.2724	1.170e5		eelog: 8/12

347.6809	1.607e4		eelog: 8/12
347.6847	1.830e4	ITMy?	23
347.7		ITMy	eelog: 4/26/2002
347.7300	1.656e4	MC1_LL,MC2_LR,MMT2_LL,SM?	23
347.7334	2.037e4		eelog: 8/12
686.9169			23
686.9176	1.313e5		eelog: 8/12
688		Violin Resonance Y-arm	eelog: 12/4/2002
688.2850			23
688.2860	1.689e5		eelog: 8/12
689.5115			23
689.5120	8.445e4		eelog: 8/12
689.7416			23
689.7431	4.728e4		eelog: 8/12
694.2828			23
694.2841	1.777e5		eelog: 8/12
694.5960			23
695.5974	1.069e5		eelog: 8/12
695.4212	1.440e5		eelog: 8/12
695.4199			23
695.4811			23
695.4828	1.503e5		eelog: 8/12
708.30		Small optics suspension system resonances	13
1030.5585			23
1030.5599	1.000e5		eelog: 8/12

1032.5874			23
1032.5884	1.000e5		eelog: 8/12
1032.5908			23
1034.4276	1.001e5		eelog: 8/12
1034.4598			23
1034.8027			23
1034.8040	1.000e5		eelog: 8/12
1041.6249			23
1041.6267	1.777e5		eelog: 8/12
1042.1226			23
1042.1253	1.348e5		eelog: 8/12
1043.3230			23
1043.3256	1.894e5		eelog: 8/12
1043.4469			23
1043.4484	2.009e5		eelog: 8/12
1416.34		Small optics suspension system resonances	13

Magnet Standoff Assembly Resonances (H1)

Pathfinder Resonances (H1)

Description	f_{th} (Hz)	f_{meas} (Hz)	Q_{th}	Q_{meas}	References
with Dumpbell Standoffs					
		9476.4		1.3×10^6	-/5-/5
		22421.5		4.6×10^5	-/5-/5
		25632.3		2.6×10^6	-/5-/5

		29484.2		1.1×10^6	-/5/-/5
		29866.2		not measurable	-/5/-/5
		38763.2		8.8×10^5	-/5/-/5
		42758.3		4.8×10^6	-/5/-/5
		47332.4		5.4×10^6	-/5/-/5
magnet/standoff assembly attached to pathfinder					
		9700		130	-/5/-/5
		34600		>30	-/5/-/5

Calculated Resonance Frequencies Of The Periscope Basic

Mode No.	Resonance Frequencies (Hz)	References
1	203	16
2	301	16
3	317	16
4	659	16
5	748	16
6	820	16

Horizontal Acces Module (HAM) Resonances (H1)

Description	f_{th} (Hz)	f_{meas} (Hz)	Q_{th}	Q_{meas}	References
Vert-Vert (w-w) Transfer''''''					
	3.3	3.2			8/8/-/-

	7.8	7.8			8/8/-/-
	12.1	12.1			8/8/-/-
Beamline (u-u) Transfer					
	1.5	1.5			8/8/-/-
	2.4	2.3			8/8/-/-
	7.2	7.2			8/8/-/-
	7.7	7.7			8/8/-/-
	9.7	10.1			8/8/-/-
	13.2	13.4			8/8/-/-
Vert-Yaw Transfer					
		3.1			-/8/-/-
		7.2			-/8/-/-
		8.0			-/8/-/-
		9.4			-/8/-/-
		12.1			-/8/-/-
		13.4			-/8/-/-
Transverse-Horizontal (v-v) Transfer					
	1.8	1.6			7/7/-/-
	3.2	2.8			7/7/-/-
	7.3	7.3			7/7/-/-
	8.0	8.0			7/7/-/-
	10.0	10.3			7/7/-/-
	13.2	13.4			7/7/-/-

HAM Optic Table Calculated Resonances (H1)

Mode	f_{th} (Hz)	Mode	f_{th} (Hz)
1	250	10	615
2	342	11	622
3	397	12	622
4	457	13	623
5	474	14	628
6	559	15	639
7	584	16	643
8	584	17	645
9	596	18	654

Basic Symmetric Chamber (BSC) Resonances (H1)

Description	f_{th} (Hz)	f_{meas} (Hz)	Q_{th}	Q_{meas}	References
Horizontal-Horizontal Transfer					
	1.3	1.2			7/7/-/-
	2.4	2.2			7/7/-/-
	5.5	5.5			7/7/-/-
	10.0	10.0			7/7/-/-
	13.1	13.1			7/7/-/-
Vertical-Vertical Transfer					
	2.9	2.7			7/7/-/-
	6.5	6.4			7/7/-/-
	10.2	10.3			7/7/-/-
	13.1	13.1			7/7/-/-

Horizontal-Pitch Transfer					
	1.3	1.2			7/7/-/-
	2.4	2.2			7/7/-/-
	6.9	6.5			7/7/-/-
	11.5	11.5			7/7/-/-
	14.4	14.4			7/7/-/-
Vertical-Vertical Transfer					
	2.9	2.7			7/7/-/-
	6.5	6.4			7/7/-/-
	10.3	10.3			7/7/-/-
	13.1	13.1			7/7/-/-

BSC Downtube Resonances (H1)

Description	f_{th} (Hz)	f_{meas} (Hz)	Q_{th}	Q_{meas}	References
	349	349			11/6/-/-
	355	360			11/6/-/-
	370				11/-/-/-
	371	376			11/6/-/-
	399	399			11/6/-/-
	421	420			11/6/-/-
	441				11/-/-/-
	462				11/-/-/-
	463				11/-/-/-
	478				11/-/-/-
	556				11/-/-/-

	560				11/-/-/-
	583				11/-/-/-
	611				11/-/-/-
	615				11/-/-/-
	683				11/-/-/-
	690				11/-/-/-
	702				11/-/-/-

H1 Resonances (last edited 2009-10-29 19:20:47 by MichaelRodruck)