T1300406 Wide Angle Scatter from ITM
2/4/11

Displacement noise requirement @ 100 Hz, m/rt Hz	$D_{req} := 1 \cdot 10^{-21}$
Motion of manifold @ 100 Hz, m/rt Hz	$x_{manifold} := 8 \cdot 10^{-11}$
ACB displacement @ 100 Hz, m/rtHz	$x_{ACB} := 1 \cdot 10^{-12}$
ISI optical table displacement @ 100 Hz, m/rtHz	$x_{ISI} := 3 \cdot 10^{-14}$
Transfer function @ 100 Hz, ITM HR	$TF_{itmhr} := 1.1 \cdot 10^{-9}$
BRDF of chamber wall, sr^-1	$BRDF_{wall} := 0.1$
BRDF of porcelainized steel, sr^-1	$BRDF_{porc} := 0.04$
BRDF of black glass, sr^-1	$BRDF_{bg} := 1 \cdot 10^{-6}$
BRDF of BD, sr^-1	$BRDF_{bd} := 0.030$
BRDF of oxidized un-polished steel, sr^-1	$BRDF_{oxiunpolish} := 0.03$
laser wavelength, m	$\lambda := 1.064 \cdot 10^{-6}$
wave number, m^-1	$k := 2 \cdot \frac{\pi}{\lambda}$ $k = 5.905 \times 10^{6}$
hemispherical scattering loss fraction TM wide angle(ref: T070089)	$\alpha_{TM} := 10 \times 10^{-6}$

see T070303 with arm cavity gain = 13000

arm power, W	$P_a := 8.125 \times 10^{5}$
input laser power, W	$P_{psl} := 125$
arm cavity length, m	$L := 4000$

The following data comes from ZEMAX sensor data; see /ALIGO/SLC/ACB/wide angle scatter_ITMX_H1_power.xls

SCATTER PATH LENGTH

distance from ITM to WIDE ANGLE BAF TOP LEDGE ITMX, m	$L_{wabtop} := 0.6$
distance from ITM to WIDE ANGLE BAF BOTTOM LEDGE ITMX, m	$L_{wabbot} := 0.4$
distance from WIDE ANGLE BAF PLATE 1 ITMX, m	$L_{wabp1} := 1.3$
distance from WIDE ANGLE BAF PLATE 2 ITMX, m	$L_{wabp2} := 1.1$
distance from WIDE ANGLE BAF PLATE 3 ITMX, m	$L_{wabp3} := 0.9$
distance from WIDE ANGLE BAF PLATE 4 ITMX, m	$L_{wabp4} := 0.8$
distance from WIDE ANGLE BAF SIDE right, m	$L_{wabsr} := 0.7$
distance from WIDE ANGLE BAF SIDE left, m	$L_{wabsl} := 0.4$
distance from WIDE ANGLE Side Extender, m	$L_{wabse} := 0.24$
distance from PLATE above TM, m	$L_{ptm} := 0.24$
distance from SUS ring around TM, m	$L_{rtm} := 0.17$
distance from ACB, m	$L_{acb} := 0.8$
distance from UPPER BSC, m	$L_{upbsc} := 2$
distance from FLOOR BSC, m	$L_{floorbsc} := 0.8$

distance from SPOOL, m $L_{spool} := 2.3$

distance from Manifold, m $L_{mani} := 5$

distance from ETMx manifold flat baffle, m $L_{maniflat} := 2.393$

COC INCIDENT ANGLE

incident angle from WIDE ANGLE BAF TOP LEDGE ITMX, rad $\theta_{wabtop} := 1.0$

incident angle from WIDE ANGLE BAF BOTTOM LEDGE ITMX, rad $\theta_{wabbot} := 0.6$

incident angle from WIDE ANGLE BAF PLATE 1 ITMX, rad $\theta_{wabp1} := 1.3$

incident angle from WIDE ANGLE BAF PLATE 2 ITMX, rad $\theta_{wabp2} := 1$

incident angle from WIDE ANGLE BAF PLATE 3 ITMX, rad $\theta_{wabp3} := 1.2$

incident angle from WIDE ANGLE BAF PLATE 4 ITMX, rad $\theta_{wabp4} := 0.6$

incident angle from WIDE ANGLE BAF SIDE right, rad $\theta_{wabsr} := 1.05$

incident angle from WIDE ANGLE BAF SIDE left, rad $\theta_{wabsl} := 0.53$

incident angle from WIDE ANGLE Side Extender, rad $\theta_{wabse} := 1.26$

incident angle from PLATE above TM, rad $\theta_{ptm} := 1.4$

incident angle from SUS ring around TM, rad $\theta_{rtm} := 1.5$

incident angle from ACB, rad	$\theta_{acb} := 0.32$
incident angle from UPPER BSC, rad	$\theta_{upbsc} := 1.4$
incident angle from FLOOR BSC, rad	$\theta_{floorbsc} := 1.4$
incident angle from SPOOL, rad	$\theta_{spool} := 0.17$
incident angle from Manifold, rad	$\theta_{mani} := 0.08$
incident angle from ETMx manifold flat baffle, rad	$\theta_{maniflat} := 0.08$

FRACTION of LAMBERTIAN SCATTER FROM COC HITTING SURFACE

fractional power from WIDE ANGLE BAF TOP LEDGE ITMX	$PF_{wabtop} := 0.077$	$PF_{wabtop} := 0.083$
fractional power from WIDE ANGLE BAF BOTTOM LEDGE ITMX	$PF_{wabbot} := 0.21$	$PF_{wabbot} := 0.22$
fractional power from WIDE ANGLE BAF PLATE 1 ITMX	$PF_{wabp1} := 0.037$	$PF_{wabp1} := 0.002$
fractional power from WIDE ANGLE BAF PLATE 2 ITMX	$PF_{wabp2} := 0.082$	$PF_{wabp2} := 0.0012$
fractional power from WIDE ANGLE BAF PLATE 3 ITMX	$PF_{wabp3} := 0.12$	$PF_{wabp3} := 0.0038$
fractional power from WIDE ANGLE BAF PLATE 4 ITMX	$PF_{wabp4} := 0.165$	$PF_{wabp4} := 0.0008$
fractional power from WIDE ANGLE BAF SIDE right	$PF_{wabsr} := 0.047$	$PF_{wabsr} := 0.069$
fractional power from WIDE ANGLE BAF SIDE left	$PF_{wabsl} := 0.16$	$PF_{wabsl} := 0.24$
fractional power from WIDE ANGLE Side Extender		$PF_{wabse} := 0.007$
fractional power from PLATE above TM	$FP_{ptm} := 5 \cdot 10^{-3}$	$FP_{ptm} := 7 \cdot 10^{-3}$

fractional power from SUS ring around TM	$FP_{rtm} := 8 \cdot 10^{-3}$	$FP_{rtmv} := 10 \cdot 10^{-3}$
fractional power from ACB	$PF_{acb} := 0.232$	$PF_{acbv} := 0.269$
fractional power from UPPER BSC	$PF_{upbsc} := 0.006$	$PF_{upbscv} := 0.003$
fractional power from FLOOR BSC	$PF_{floorbsc} := 0.002$	$PF_{floorbscv} := 0.007$
fractional power from SPOOL	$PF_{spool} := 0.0095$	$PF_{spoolv} := 0.045$
fractional power from Manifold	$PF_{mani} := 0.030$	$PF_{manivv} := 0.033$
fractional power from ETMx Manifold flat baffle	$PF_{maniflat} := 0.037$	

INCIDENT POWER

ACB BACK, W

$$P_{acb} := P_a \cdot PF_{acb} \cdot \alpha_{TM} = 2.186 \qquad P_a = 8.125 \times 10^{5}$$

WIDE ANGLE BAF TOP LEDGE, W

$$P_{wabtop} := P_a \cdot PF_{wabtop} \cdot \alpha_{TM} = 0.674$$

WIDE ANGLE BAF BOTTOM LEDGE, W

$$P_{wabbot} := P_a \cdot PF_{wabbot} \cdot \alpha_{TM} = 1.787$$

WIDE ANGLE BAF PLATE 1 ITMX, W

$$P_{wabp1} := P_a \cdot PF_{wabp1} \cdot \alpha_{TM} = 0.016$$

WIDE ANGLE BAF PLATE 2 ITMX, W

$$P_{wabp2} := P_a \cdot PF_{wabp2} \cdot \alpha_{TM} = 9.75 \times 10^{-3}$$

WIDE ANGLE BAF PLATE 3 ITMX, W

$$P_{wabp3} := P_a \cdot PF_{wabp3} \cdot \alpha_{TM} = 0.031$$

WIDE ANGLE BAF PLATE 4 ITMX, W

$$P_{wabp4} := P_a \cdot PF_{wabp4} \cdot \alpha_{TM} = 6.5 \times 10^{-3}$$

WIDE ANGLE BAF SIDE right, W

$$P_{wabsr} := P_a \cdot PF_{wabsr} \cdot \alpha_{TM} = 0.561$$

WIDE ANGLE BAF SIDE left, W

$$P_{wabsl} := P_a \cdot PF_{wabsl} \cdot \alpha_{TM} = 1.95$$

WIDE ANGLE BAF SIDE Extender, W

$$P_{wabse} := P_a \cdot PF_{wabse} \cdot \alpha_{TM} = 0.057$$

PLATE above TM, W

$$P_{ptm} := P_a \cdot FP_{ptm} \cdot \alpha_{TM} = 0.057$$

SUS ring around TM, W

$$P_{rtm} := P_a \cdot FP_{rtm} \cdot \alpha_{TM} = 0.081$$

UPPER BSC, W

$$P_{upbsc} := P_a \cdot PF_{upbsc} \cdot \alpha_{TM} = 0.024$$

FLOOR BSC, W

$$P_{floor} := P_a \cdot PF_{floorbsc} \cdot \alpha_{TM} = 0.057$$

SPOOL, W

$$P_{spool} := P_a \cdot PF_{spool} \cdot \alpha_{TM} = 0.366$$

MANIFOLD, W

$$P_{mani} := P_a \cdot PF_{mani} \cdot \alpha_{TM} = 0.268$$

ETMX MANIFOLD FLAT BAF, W

$$P_{maniflat} := P_a \cdot PF_{maniflat} \cdot \alpha_{TM} = 0.301$$

POWER SCATTERED INTO IFO MODE

$P_{inc} := 1$

$w_{ifo} := 1$

$BRDF_s := 1$

$\theta_{inc} := 1$

$$P_{sTM} := P_{inc} \cdot BRDF_s \cdot \frac{\pi \cdot w_{ifo}^2}{L^2} \qquad P_{sTMifo} := P_{inc} \cdot BRDF_s \cdot \frac{\alpha_{TM}}{\pi \cdot L^2} \cdot \lambda^2 \cdot \cos(\theta_{inc})$$

$$P_{sTMifo} := P_{sTM} \cdot \frac{\alpha_{TM}}{\pi} \cdot \cos(\theta_{inc}) \cdot \frac{\lambda^2}{(\pi \cdot w_{ifo}^2)}$$

$P_{acb} = 2.186$

ACB BACK, W

$$P_{acbifo} := \sqrt{4} \cdot P_{acb} \cdot \left(\alpha_{TM} \cdot \frac{\lambda^2}{\pi \cdot L_{acb}^2} \cdot BRDF_{oxiunpolish} \cdot \cos(\theta_{acb}) \right)$$

$P_{acbifo} = 7.009 \times 10^{-19}$

WIDE ANGLE BAF TOP LEDGE, W

$$P_{wabtopifo} := \sqrt{4} \cdot P_{wabtop} \cdot \left(\alpha_{TM} \cdot \frac{\lambda^2}{\pi \cdot L_{wabtop}^2} \cdot BRDF_{oxiunpolish} \cdot \cos(\theta_{wabtop}) \right)$$

$P_{wabtopifo} = 2.188 \times 10^{-19}$

WIDE ANGLE BAF BOTTOM LEDGE, W

$$P_{wabbotifo} := \sqrt{4}\cdot P_{wabbot}\cdot\left(\alpha_{TM}\cdot\frac{\lambda^2}{\pi\cdot L_{wabbot}^2}\cdot BRDF_{oxiunpolish}\cdot\cos\left(\theta_{wabbot}\right)\right)$$

$$P_{wabbotifo} = 1.994\times 10^{-18}$$

WIDE ANGLE BAF SIDE right, W

$$P_{wabsrifo} := \sqrt{4}\cdot P_{wabsr}\cdot\left(\alpha_{TM}\cdot\frac{\lambda^2}{\pi\cdot L_{wabsr}^2}\cdot BRDF_{oxiunpolish}\cdot\cos\left(\theta_{wabsr}\right)\right)$$

$$P_{wabsrifo} = 1.231\times 10^{-19}$$

WIDE ANGLE BAF SIDE left, W

$$P_{wabslifo} := \sqrt{4}\cdot P_{wabsl}\cdot\left(\alpha_{TM}\cdot\frac{\lambda^2}{\pi\cdot L_{wabsl}^2}\cdot BRDF_{oxiunpolish}\cdot\cos\left(\theta_{wabsl}\right)\right)$$

$$P_{wabslifo} = 2.274\times 10^{-18}$$

WIDE ANGLE BAF SIDE Extender, W

$$P_{wabseifo} := \sqrt{4}\cdot P_{wabse}\cdot\left(\alpha_{TM}\cdot\frac{\lambda^2}{\pi\cdot L_{wabse}^2}\cdot BRDF_{oxiunpolish}\cdot\cos\left(\theta_{wabse}\right)\right)$$

$$P_{wabseifo} = 6.529\times 10^{-20}$$

TOTAL WIDE ANGLE BAF SIDE, W

$$P_{wabstifo} := \left(P_{wabsrifo}^{2} + P_{wabslifo}^{2} + P_{wabseifo}^{2}\right)^{0.5}$$

$$P_{wabstifo} = 2.278 \times 10^{-18}$$

TOTAL ACB BACK AND BOX, W

$$P_{wacbboxifo} := \left(P_{acbifo}^{2} + P_{wabtopifo}^{2} + P_{wabbotifo}^{2} + P_{wabsrifo}^{2} + P_{wabslifo}^{2} + P_{wabseifo}^{2}\right)^{0.5}$$

$$P_{wacbboxifo} = 3.115 \times 10^{-18}$$

WIDE ANGLE BAF PLATE 1 ITMX, W

$$P_{wabp1ifo} := \sqrt{4} \cdot P_{wabp1} \cdot \left(\alpha_{TM} \cdot \frac{\lambda^{2}}{\pi \cdot L_{wabp1}^{2}} \cdot BRDF_{oxiunpolish} \cdot \cos\left(\theta_{wabp1}\right) \right)$$

$$P_{wabp1ifo} = 5.561 \times 10^{-22}$$

WIDE ANGLE BAF PLATE 2 ITMX, W

$$P_{wabp2} = 9.75 \times 10^{-3}$$

$$P_{wabp2ifo} := \sqrt{4} \cdot P_{wabp2} \cdot \left(\alpha_{TM} \cdot \frac{\lambda^{2}}{\pi \cdot L_{wabp2}^{2}} \cdot BRDF_{oxiunpolish} \cdot \cos\left(\theta_{wabp2}\right) \right)$$

$$P_{wabp2ifo} = 9.413 \times 10^{-22}$$

WIDE ANGLE BAF PLATE 3 ITMX, W

$$P_{wabp3ifo} := \sqrt{4} \cdot P_{wabp3} \cdot \left(\alpha_{TM} \cdot \frac{\lambda^{2}}{\pi \cdot L_{wabp3}^{2}} \cdot BRDF_{oxiunpolish} \cdot \cos\left(\theta_{wabp3}\right) \right)$$

$$P_{wabp3ifo} = 2.986 \times 10^{-21}$$

WIDE ANGLE BAF PLATE 4 ITMX, W

$$P_{wabp4ifo} := \sqrt{4}\cdot P_{wabp4}\cdot\left(\alpha_{TM}\cdot\frac{\lambda^2}{\pi\cdot L_{wabp4}^{\ 2}}\cdot BRDF_{oxiunpolish}\cdot\cos\left(\theta_{wabp4}\right)\right)$$

$$P_{wabp4ifo} = 1.812\times 10^{-21}$$

PLATE above TM, W

$$P_{ptmifo} := \sqrt{4}\cdot P_{ptm}\cdot\left(\alpha_{TM}\cdot\frac{\lambda^2}{\pi\cdot L_{ptm}^{\ 2}}\cdot BRDF_{wall}\cdot\cos\left(\theta_{ptm}\right)\right)$$

$$P_{ptmifo} = 1.21\times 10^{-19}$$

SUS ring around TM, W

$$P_{rtmifo} := \sqrt{4}\cdot P_{rtm}\cdot\left(\alpha_{TM}\cdot\frac{\lambda^2}{\pi\cdot L_{rtm}^{\ 2}}\cdot BRDF_{wall}\cdot\cos\left(\theta_{rtm}\right)\right)$$

$$P_{rtmifo} = 1.433\times 10^{-19}$$

TOTAL SUS, W

$$P_{susifo} := \left(P_{ptmifo}^{\ 2} + P_{rtmifo}^{\ 2}\right)^{0.5}$$

$$P_{susifo} = 1.875\times 10^{-19}$$

TOTAL WIDE ANGLE BAF PLATE
ITMX, W

$$P_{wabptifo} := \left(P_{wabp1ifo}^{\ 2} + P_{wabp2ifo}^{\ 2} + P_{wabp3ifo}^{\ 2} + P_{wabp4ifo}^{\ 2}\right)^{0.5}$$

$$P_{wabptifo} = 3.66\times 10^{-21}$$

UPPER BSC, W

$$P_{upbscifo} := \sqrt{4}\cdot P_{upbsc}\cdot\left(\alpha_{TM}\cdot\frac{\lambda^2}{\pi\cdot L_{upbsc}^{\ 2}}\cdot BRDF_{wall}\cdot\cos\left(\theta_{upbsc}\right)\right)$$

$$P_{upbscifo} = 7.465\times 10^{-22}$$

FLOOR BSC, W

$$P_{floorbscifo} := \sqrt{4}\cdot P_{floor}\cdot\left(\alpha_{TM}\cdot\frac{\lambda^2}{\pi\cdot L_{floorbsc}^{\ 2}}\cdot BRDF_{wall}\cdot\cos\left(\theta_{floorbsc}\right)\right)$$

$$P_{floorbscifo} = 1.089\times 10^{-20}$$

SPOOL, W

$$P_{spoolifo} := \sqrt{4}\cdot P_{spool}\cdot\left(\alpha_{TM}\cdot\frac{\lambda^2}{\pi\cdot L_{spool}^{\ 2}}\cdot BRDF_{wall}\cdot\cos\left(\theta_{spool}\right)\right)$$

$$P_{spoolifo} = 4.91\times 10^{-20}$$

MANIFOLD, W

$$P_{maniifo} := \sqrt{4}\cdot P_{mani}\cdot\left(\alpha_{TM}\cdot\frac{\lambda^2}{\pi\cdot L_{mani}^{\ 2}}\cdot BRDF_{wall}\cdot\cos\left(\theta_{mani}\right)\right)$$

$$P_{maniifo} = 7.705\times 10^{-21}$$

MANIFOLD FLAT
BAF, W

$$P_{maniflatifo} := \sqrt{2}\cdot P_{maniflat}\cdot\left(\alpha_{TM}\cdot\frac{\lambda^2}{\pi\cdot L_{maniflat}^{\ 2}}\cdot BRDF_{bd}\cdot\cos\left(\theta_{maniflat}\right)\right)$$

$P_{maniflatifo} = 8.001 \times 10^{-21}$

DISPLACEMENT NOISE @ 100 Hz, m/rtHz

$\theta_t := 0$ $x_s := 1$

Displacement Noise Requirement @ 100 Hz, m/rt Hz

$D_{req} = 1 \times 10^{-21}$

$$DN_s := TF_{itmhr} \cdot \left(\frac{P_{sTMifo}}{P_{psl}} \right)^{0.5} \cdot \frac{2 \cdot k \cdot x_s}{\sqrt{2}}$$

Wide Angle Baffle top

$$DN_{wabtop} := TF_{itmhr} \cdot \left(\frac{P_{wabtopifo}}{P_{psl}} \right)^{0.5} \cdot x_{ACB} \cdot \frac{2}{\sqrt{2}} \cdot k$$

$DN_{wabtop} = 3.844 \times 10^{-25}$

Wide Angle Baffle bottom

$$DN_{wabbot} := TF_{itmhr} \cdot \left(\frac{P_{wabbotifo}}{P_{psl}} \right)^{0.5} \cdot x_{ACB} \cdot \frac{2}{\sqrt{2}} \cdot k$$

$DN_{wabbot} = 1.16 \times 10^{-24}$

Wide Angle Baffle Sides

$$DN_{wabst} := TF_{itmhr} \cdot \left(\frac{P_{wabstifo}}{P_{psl}} \right)^{0.5} \cdot x_{ACB} \cdot \frac{2}{\sqrt{2}} \cdot k$$

$DN_{wabst} = 1.24 \times 10^{-24}$

Wide Angle Plate Total

$$DN_{wabpt} := TF_{itmhr} \cdot \left(\frac{P_{wabptifo}}{P_{psl}} \right)^{0.5} \cdot x_{manifold} \cdot \frac{2}{\sqrt{2}} \cdot k$$

$$DN_{wabpt} = 3.977 \times 10^{-24}$$

SUS

$$DN_{sus} := TF_{itmhr} \cdot \left(\frac{P_{susifo}}{P_{psl}} \right)^{0.5} \cdot x_{ISI} \cdot \frac{2}{\sqrt{2}} \cdot k$$

$$DN_{sus} = 1.067 \times 10^{-26}$$

ACB BACK

$$DN_{acb} := TF_{itmhr} \cdot \left(\frac{P_{acbifo}}{P_{psl}} \right)^{0.5} \cdot x_{ACB} \cdot \frac{2}{\sqrt{2}} \cdot k$$

$$DN_{acb} = 6.879 \times 10^{-25}$$

ACB BACK & BOX

$$DN_{acb\_box} := TF_{itmhr} \cdot \left(\frac{P_{wacbboxifo}}{P_{psl}} \right)^{0.5} \cdot x_{ACB} \cdot \frac{2}{\sqrt{2}} \cdot k$$

$$DN_{acb\_box} = 1.45 \times 10^{-24}$$

Upper BSC

$$DN_{upbsc} := TF_{itmhr} \cdot \left(\frac{P_{upbscifo}}{P_{psl}} \right)^{0.5} \cdot x_{manifold} \cdot \frac{2}{\sqrt{2}} \cdot k$$

$$DN_{upbsc} = 1.796 \times 10^{-24}$$

Floor BSC

$$DN_{floorbsc} := TF_{itmhr} \cdot \left(\frac{P_{floorbscifo}}{P_{psl}} \right)^{0.5} \cdot x_{manifold} \cdot \frac{2}{\sqrt{2}} \cdot$$

$$DN_{floorbsc} = 6.858 \times 10^{-24}$$

Spoolpiece

$$DN_{spool} := TF_{itmhr} \cdot \left(\frac{P_{spoolifo}}{P_{psl}} \right)^{0.5} \cdot x_{manifold} \cdot \frac{2}{\sqrt{2}} \cdot k$$

$$DN_{spool} = 1.456 \times 10^{-23}$$

Manifold

$$DN_{mani} := TF_{itmhr} \cdot \left(\frac{P_{maniifo}}{P_{psl}} \right)^{0.5} \cdot x_{manifold} \cdot \frac{2}{\sqrt{2}} \cdot k$$

$$DN_{mani} = 5.77 \times 10^{-24}$$

Manifold Flat Baf

$$DN_{maniflat} := TF_{itmhr} \cdot \left(\frac{P_{maniflatifo}}{P_{psl}} \right)^{0.5} \cdot x_{manifold} \cdot \frac{2}{\sqrt{2}} \cdot$$

$$DN_{maniflat} = 5.879 \times 10^{-24}$$

DIFFUSE SCATTERING FROM PEEK AND CABLING

length of cabling, m $l_c := 2$

diameter of cabling, m $d_c := 0.006$

frontal area of cabling, m^2

$$A_c := l_c \cdot d_c = 0.012$$

diameter of peek end cap, m

$$d_{pc} := .025$$

number of peek end caps

$$N_{pc} := 4$$

total area of scattering surfaces, m^2

$$A_{tpc} := A_c + N_{pc} \cdot \frac{\pi}{4} \cdot d_{pc}^{\ 2}$$

$$A_{tpc} = 0.014$$

frontal area of ACB, m^2

$$A_{acb} := 0.7$$

Incident Power, W

PEEK AND CABLING, W

$$P_{ipc} := P_a \cdot PF_{acb} \cdot \frac{A_{tpc}}{A_{acb}} \cdot \alpha_{TM} = 0.044$$

Power Scattered into IFO Mode, W

PEEK AND CABLING, W

$$P_{pcifo} := \sqrt{4} \cdot P_{ipc} \cdot \left(\alpha_{TM} \cdot \frac{\lambda^2}{\pi \cdot L_{acb}^{\ 2}} \cdot BRDF_{wall} \cdot \cos\left(\theta_{acb}\right) \right)$$

$$P_{pcifo} = 4.66 \times 10^{-20}$$

Displacement Noise @ 100 Hz, m/rtHz

PEEK AND CABLING, W

$$DN_{pc} := TF_{itmhr} \cdot \left(\frac{P_{pcifo}}{P_{psl}} \right)^{0.5} \cdot x_{ACB} \cdot \frac{2}{\sqrt{2}} \cdot k$$

$$DN_{pc} = 1.774 \times 10^{-25}$$

k

k