

How to deal with thick OSTM with wrong coating

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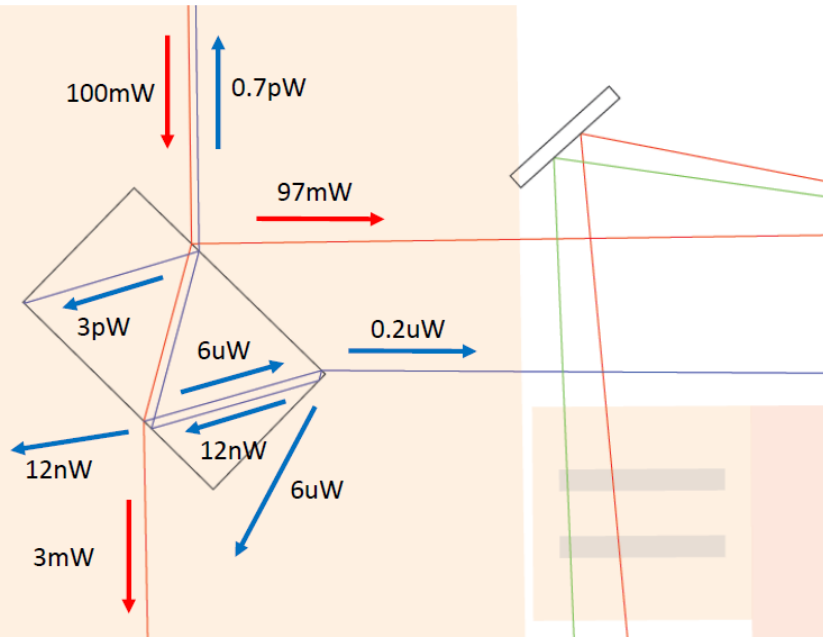
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Background

- We bought OSTM which is too thick and has wrong coating
- Too thick OSTM reads to scattered light noise

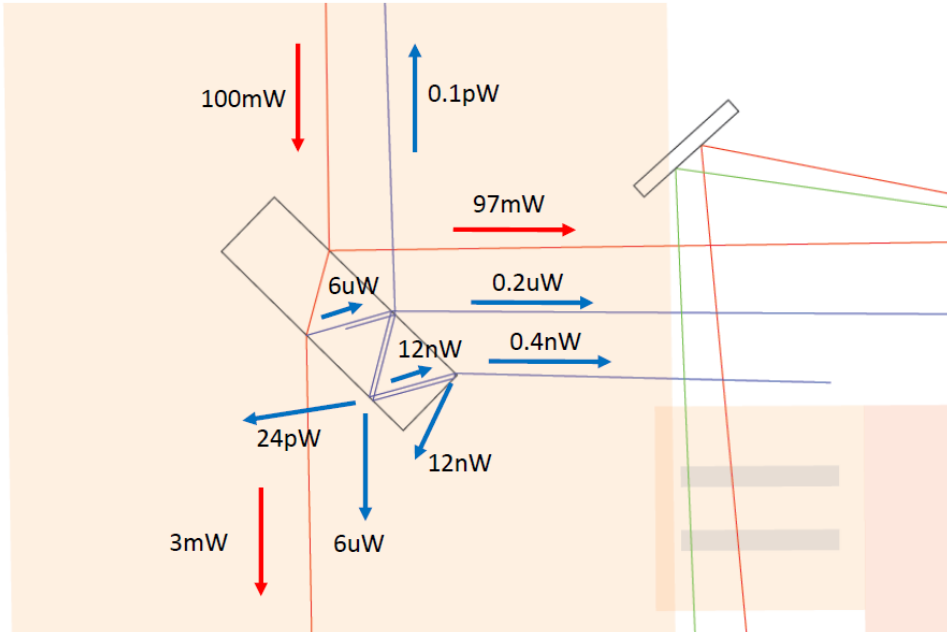
Current OSTM (~6 μ W scattering*)

t=60mm, wedge=0.3deg, 反射率がHR:97%, AR:0.2%の場合



30 mm thick OSTM (~12nW scattering*)

t=30mm, wedge=0.3deg, 反射率がHR:97%, AR:0.2%の場合



* With 100 mW AS beam (80W PRM input)
Smaller if more wedge

Options for Mirror

- Ordering what we wanted takes *** month and *** dollars (roughly the same for 60mm thick case and 30mm thick case)
- Borrowing TAMA/CLIO MC input is better option than current OSTM since it is thinner

	What we wanted	Current OSTM	TAMA/CLIO MC input
Diameter	100 mm	100 mm	100 mm
Thickness	30 mm	60 mm	30 mm
HR coating	T=1% @ p-pol, 45 deg	T<100ppm (ordered) @ s-pol, 3 ± 10 deg T=3% (measured) @ p-pol, 45 deg	T=0.18% (ordered) @ s-pol, 45 deg T=3% (measured) @ p-pol, 45 deg
AR reflectivity	R<500ppm @ p-pol, 45 deg	R<100ppm (ordered) @ s-pol, 3 ± 10 deg R<1% (rough measure) @ p-pol, 45 deg	R< 0.2 % @ s-pol, 45 deg
Wedge	2 deg	0.3 deg	No wedge

Options for Suspension

- Current OSTM suspension is made for 60mm thick mirror
- Options are
 1. Use current OSTM suspension with 60mm thick mirror
 2. Use current OSTM suspension with 30mm thick mirror with additional weight
 3. Modify current OSTM suspension for 30mm and suspend 30mm thick mirror (modification takes ~6 weeks after arrival of the parts; parts takes ~20-man yen)
 4. Borrow TAMA/CLIO MC input suspension for 30mm and suspend 30mm thick mirror

Suggestion from MIF

- \sim uW scattering in OMC chamber sounds too much to achieve enough sensitivity for GW detection
- We suggest to...