

In-vac PD and QPD Layout Brainstorming

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References

- LIGO HAM6 (OMC) Assembly [LIGO-D1000342](#)
- LIGO HAM3 (POP) Assembly [LIGO-D1000339](#)
- LIGO HAM1 (REFL) Assembly [LIGO-D1000313](#)
- LIGO ISC QPD Sled Assembly [LIGO-D1002042](#)
- LIGO ISC In-vac Gouy Phase Telescopes [LIGO-T1000247](#)
- List of KAGRA photodetectors
[JGWwiki/KAGRA/Subgroups/MIF/AEL/Photodetectors](#)
- Wiki page from in 2012
[JGWwiki/KAGRA/Subgroups/MIF/PDVac](#)

List of In-vac IR PD/QPDs

- **REFL**

RF PD, 2x RF QPD

(2 more REFL RF QPD for f3-f2 might be needed [JGW-G2315529](#),
also, there are currently 4x RF PD for in air REFL)

Need to check how many necessary

- **POP**

RF PD, 2x RF QPD

(In LIGO, there are no RF QPDs but only DC QPDs in-vac (not used in ASC).
But in KAGRA ASC design, I used POP RF QPD as well [JGW-T190359](#))

- **AS**

RF PD, 2x RF QPD (currently 2x RF PD for in air AS)

- **TRX**

DC PD, 2x DC QPD (already included in in-vac TMS design [JGW-P1807768](#))

- **TRY**

DC PD, 2x DC QPD (already included in in-vac TMS design)

- **IMC TRANS (and/or IMMT1T?)**

2x DC QPD (1x for LIGO; not urgent?)

- **OMC REFL**

2x RF QPD (for beacon WFS)

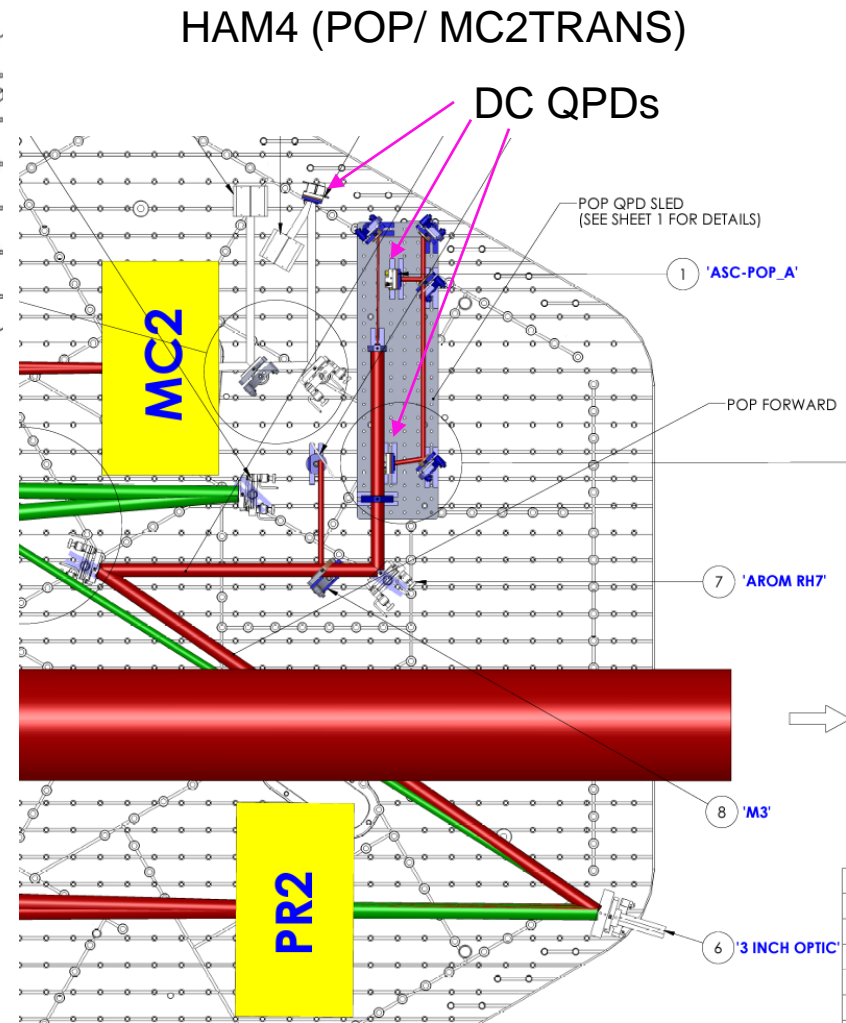
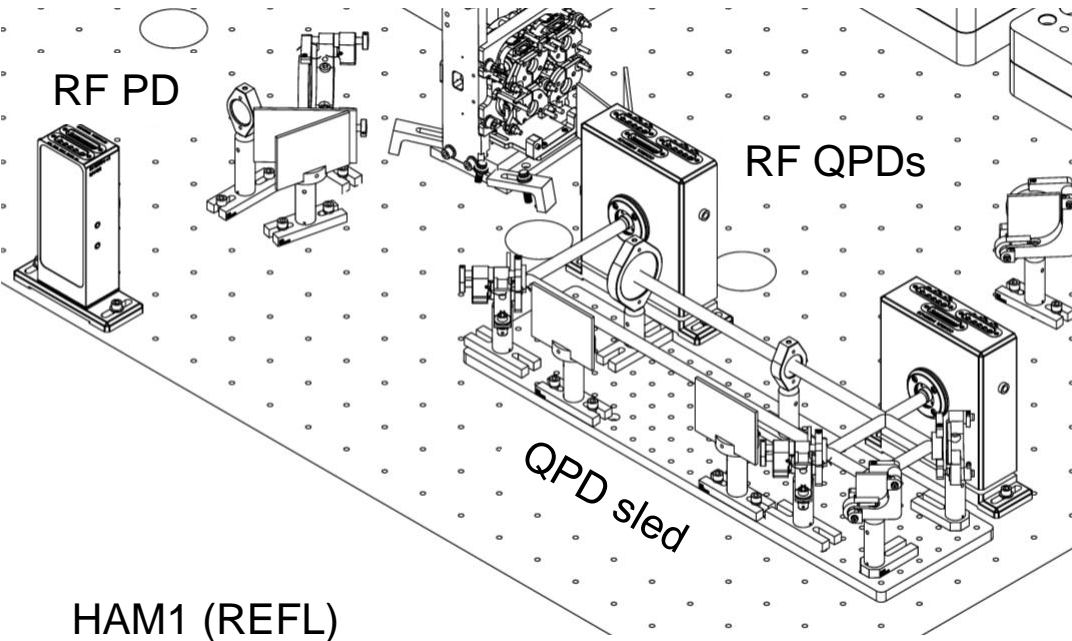
- **OMC TRANS**

2x DC PD, 2x DC QPD (already there)

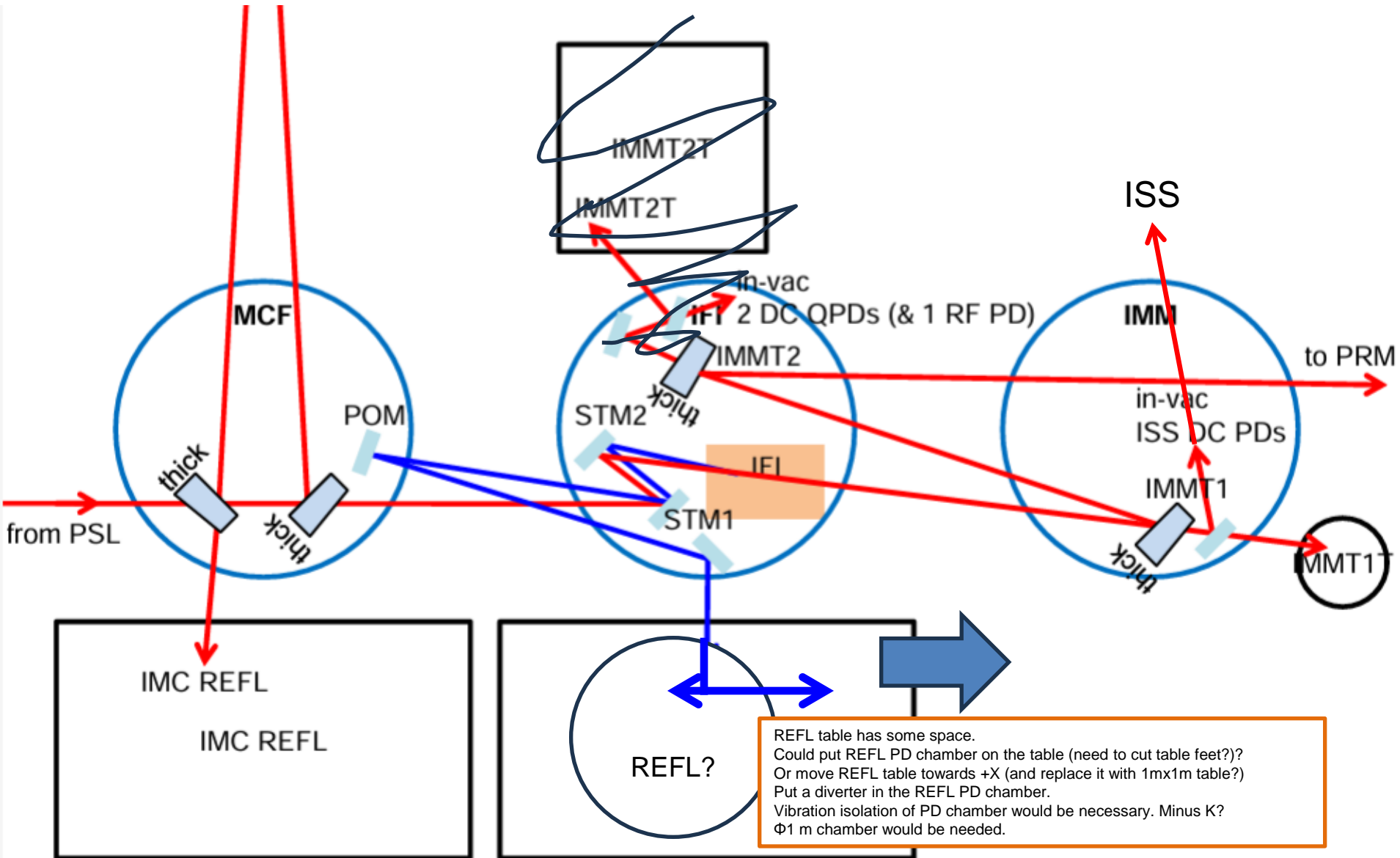
In total, excluding OMC ones

- 3 RF PDs (1x DB9, 1x 5xSMP)
- 6 RF QPDs (1x DB15, 2x 5xSMP)
- 8 DC QPDs (to be designed?)

LIGO Example



KAGRA REFL



KAGRA POP

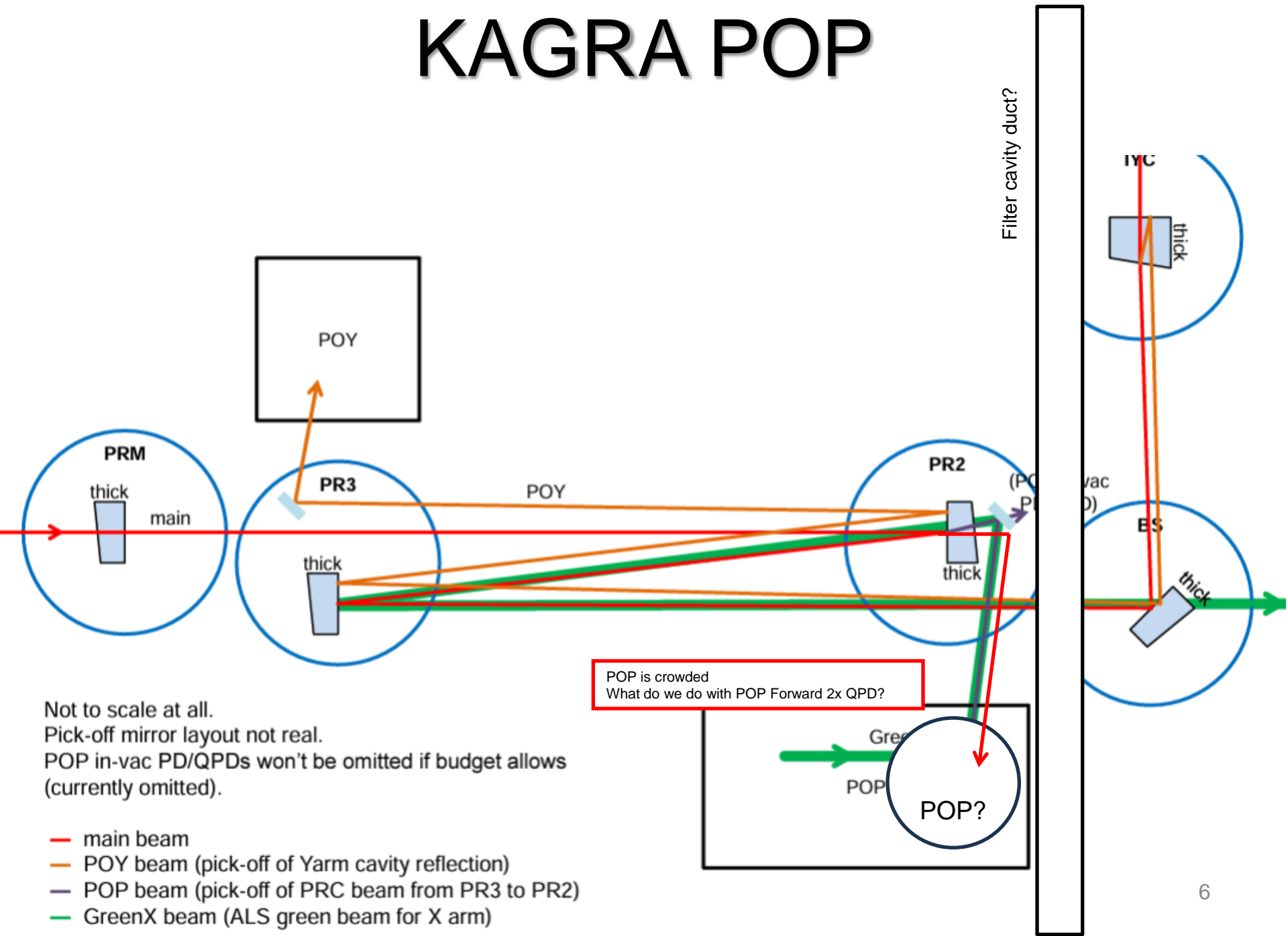
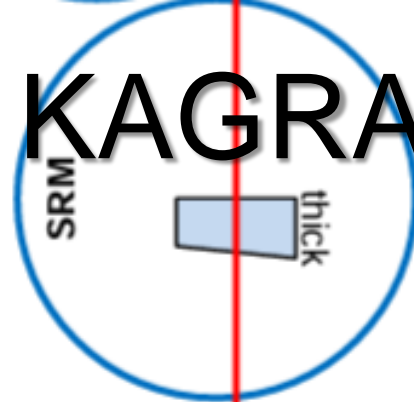


table can
-X side

OMC REF L2 beam
(reflection from OMC)

KAGRA AS

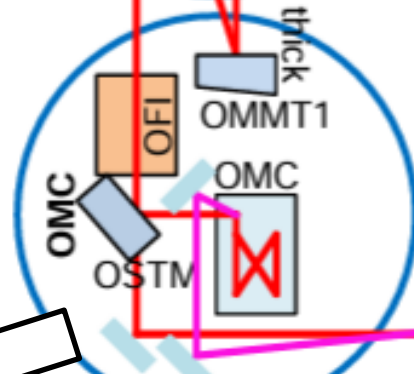
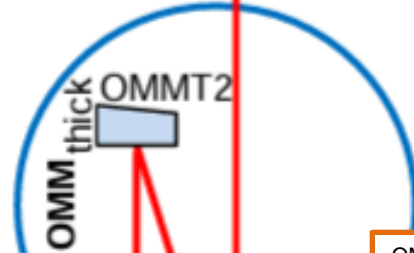


NOTE on SRM WEDGE

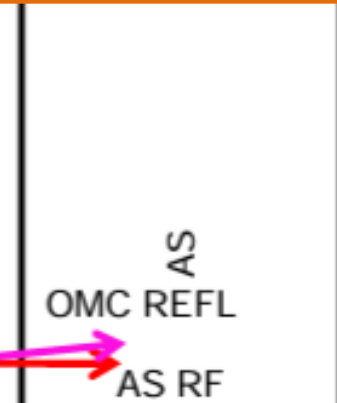
-X side was thick in Aso drawings,
but output optics were designed with
SRM being thick at +X side.

Therefore (2-inch) SRM was flipped
on February 2019

(see klog [#7943](#) and [#7977](#))



OMC REFL 2x RF QPD also necessary for now for beacon ASC.
Access doors on -X and -Y sides of OMC chamber.
Input squeezing path?
First start with checking whether if we can put in-vac PD/QPDs in OMC
chamber or not.



AS and
Filter
cavity?