KAGRA birefringent Cavity

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Overview

- In the commissioning of DRMI, we found ~10 % ppol in a single-bounce light from the ITMs.
- Our DRMI is not stable due to glitches in the error signal.
- Beam shape in the camera image at the REFL, POP table is elliptic.
- Measured power recycling gain is less than 3, although the designed value is 10. Furthermore, the contrast of the MICH is ~95 %.

Resonance in P-pol

-- P-pol power in PRC is not proportional to S-pol power at all.



When PRMI was locked

When PRX was locked

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P-pol image of single bounces from ITMs



http://klog.icrr.u-tokyo.ac.jp/osl/?r=9495



Camera images

PRMI with one arm



Camera images

PRMI without arm



Glitch in error signal



• Same structure is shown in PRCL, SRCL error sig.

Birefringence in ITMs

Birefringence in ITMY substrate was measured as a by-product (T1808715), but we had not realized it until recently.
Transmission wave front error with the substrate rotated.
Different (effective) thickness for different polarization.
Nothing but birefringence



Simulation project started in KAGRA

Regular PRMI (SB lock) with Mirror Maps

Can't see P-pol effect in this single pol model

<function matplotlib.pyplot.show>



Maxtem 4



PRM mirror scan With maps Maxtem 8



AS spot with maps



1

Our model to simulate S-P coupled D(P)RMI



2



What else?

- Error signal calculation
- Ugly beam shape
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