



Proposal for a Squeezed H1 Interferometer

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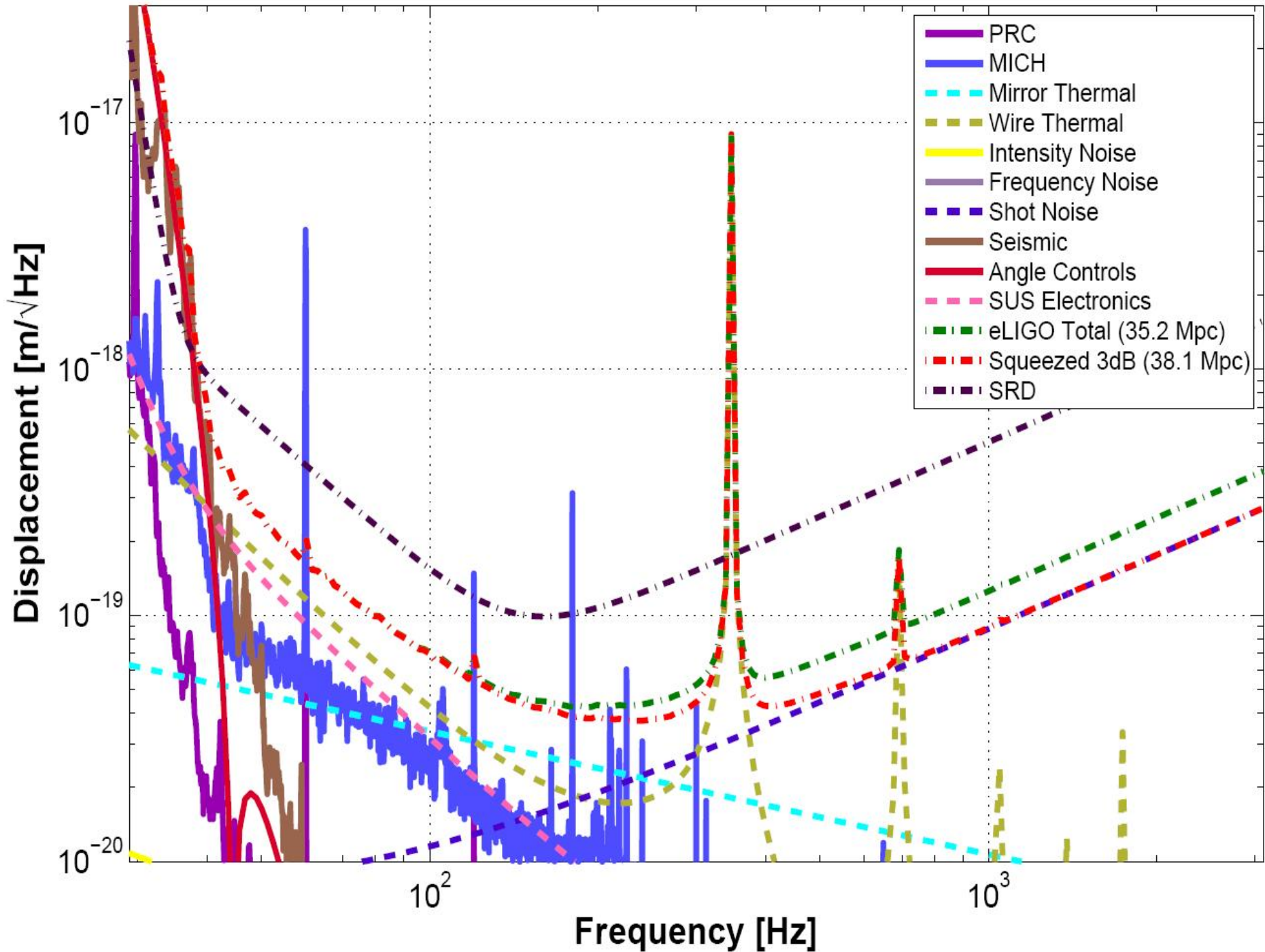
Motivation

- ❑ Squeezer technology now ready
 - 7 dB of squeezing down to 10 Hz
- ❑ High power operation in advanced LIGO
 - Biggest remaining technical risk (after DC readout)
 - Squeezing allows for lower laser power
- ❑ Squeezing has been demonstrated
 - Bench-top experiments
 - At the 40M interferometer at higher frequency
 - Plans to install a squeezer at GEO600

Missing: Low frequency noise demonstration

Goals

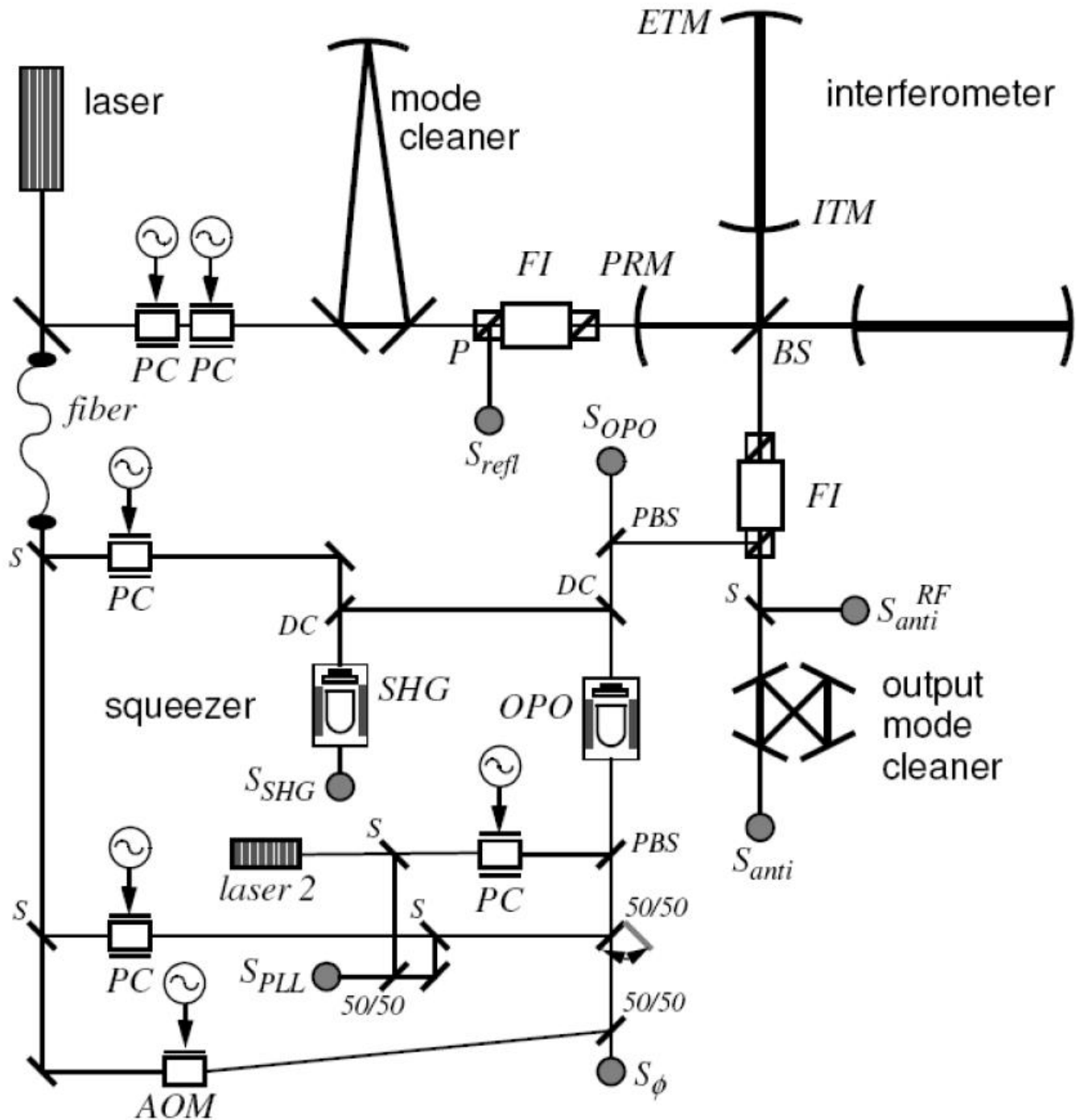
- ❑ Build a squeezer for H1
 - We need the DC readout
 - Otherwise we would need to squeeze input light at 2Ω
- ❑ Install and test it with initial LIGO
 - Target of opportunity: Availability, Interest in community, etc.
 - Next opportunity in LIGO is far down the line
 - Build up in-house knowledge & experience
- ❑ Make it available for advanced LIGO
 - Have an alternative to high power
 - As an early upgrade



Time Line



- ❑ 6 months window at LHO
 - After S6 coincidence run finishes
 - Before advanced LIGO installation starts
- ❑ Requires vacuum work for AS port Faraday
 - For the remainder can work together with an astrowatch program



Outlook

- More details can be found in LIGO-T070265-A
 - Nergis Mavalvala, David McClelland, Ping Koy Lam, Roman Schnabel, Henning Vahlbruch and Stan Whitcomb
 - Still looking for collaborators
 - Minimize required resources from LIGO lab
 - Better cost estimate
- Integrated plan with GEO600 test
- If this is going to fly:
 - Need a review and approval by this summer
 - Need money starting next FY
 - Second decision point in the middle of S6

Squeezing is an exciting new technology!