
Status of the H1 Squeezer Experiment

Excomm meeting, July 20, 2009

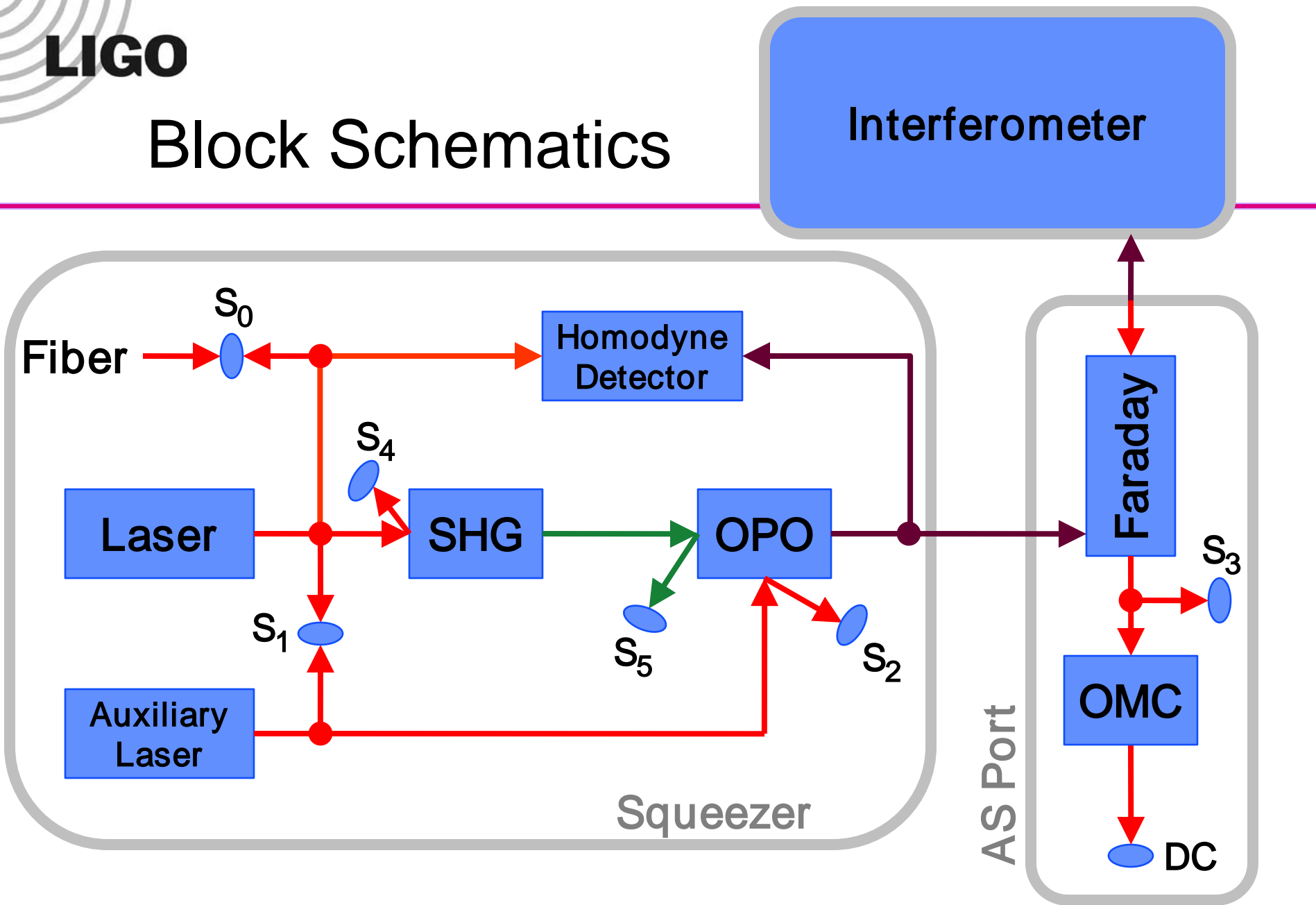
Daniel Sigg, LIGO Hanford Observatory

ANU, AEI, MIT, CIT and LHO collaboration

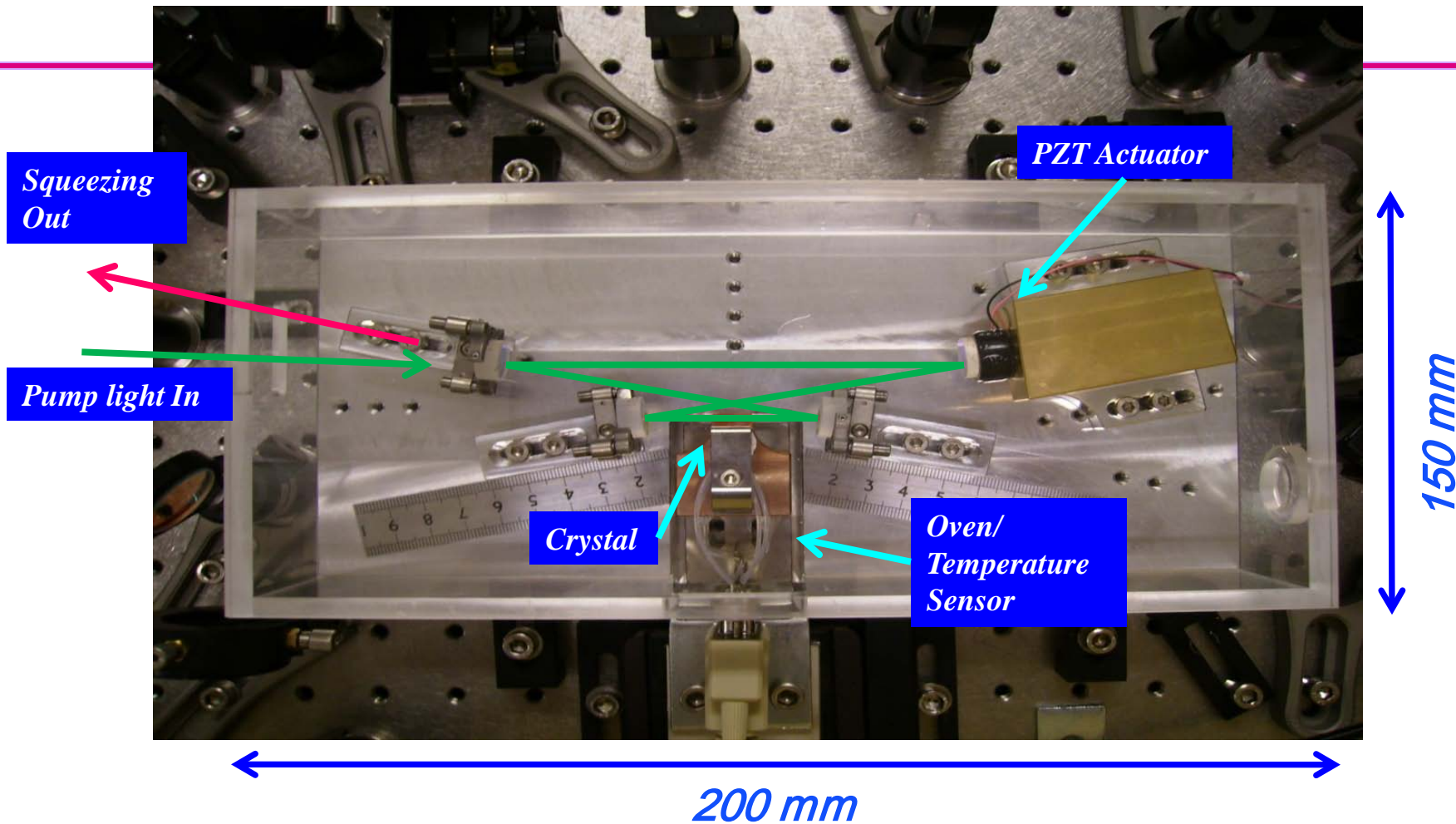
Highlights

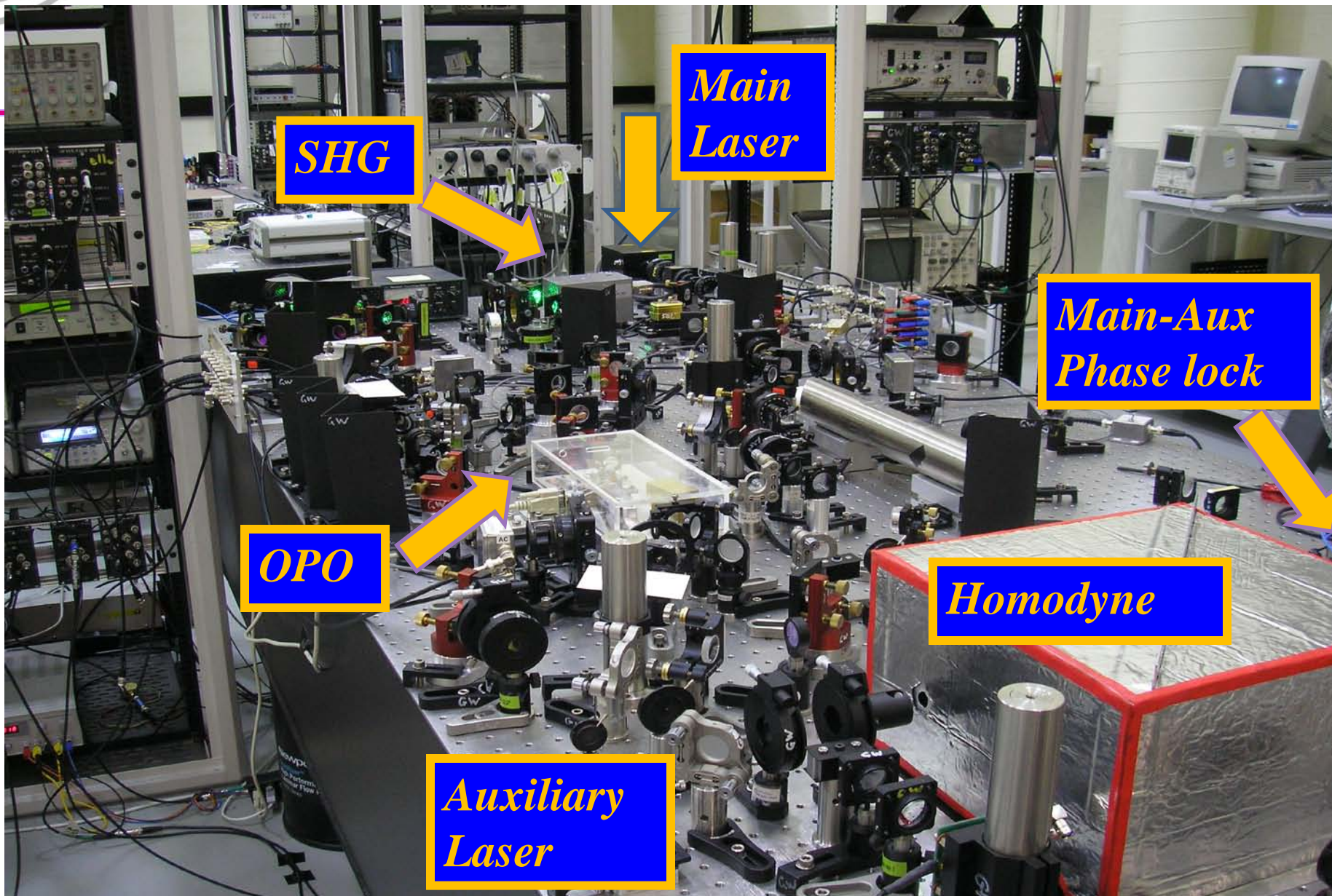
- ❑ Graduate students Sheila D. (MIT) and Sheon C. (ANU)
- ❑ OPO development at ANU
 - 6 dB of squeezing observed
 - Traveling wave bowtie design works
- ❑ AEI loaner SHG at MIT
 - In the process of building our own (copy AEI design)
- ❑ Laser, optical table and clean room installed at MIT
- ❑ Noise model in development
- ❑ Electronics design done for RF distribution
 - Shared with advanced LIGO
- ❑ Next progress review in August

Block Schematics



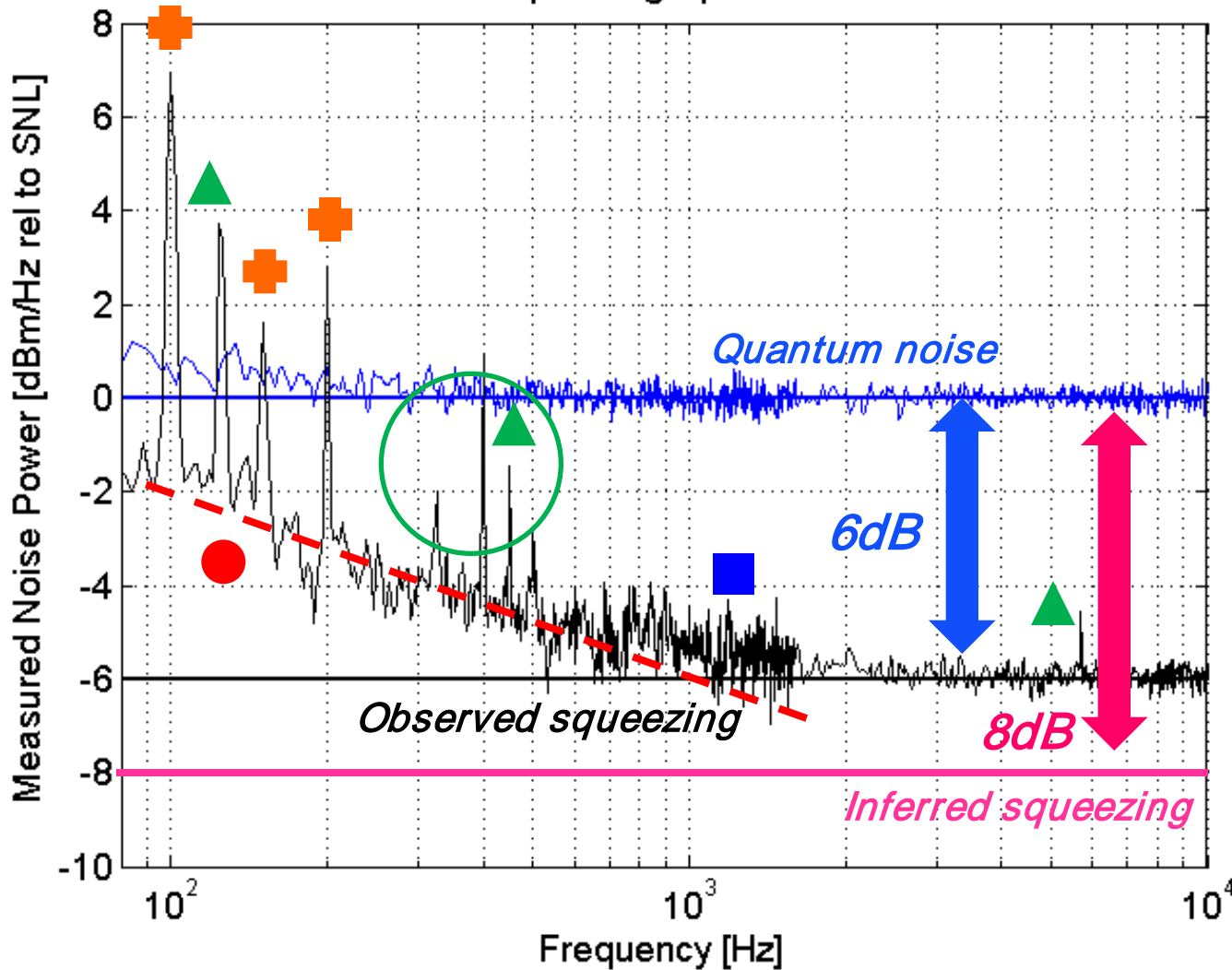
ANU Traveling Wave OPO





Squeezing Performance

Squeezing Spectrum



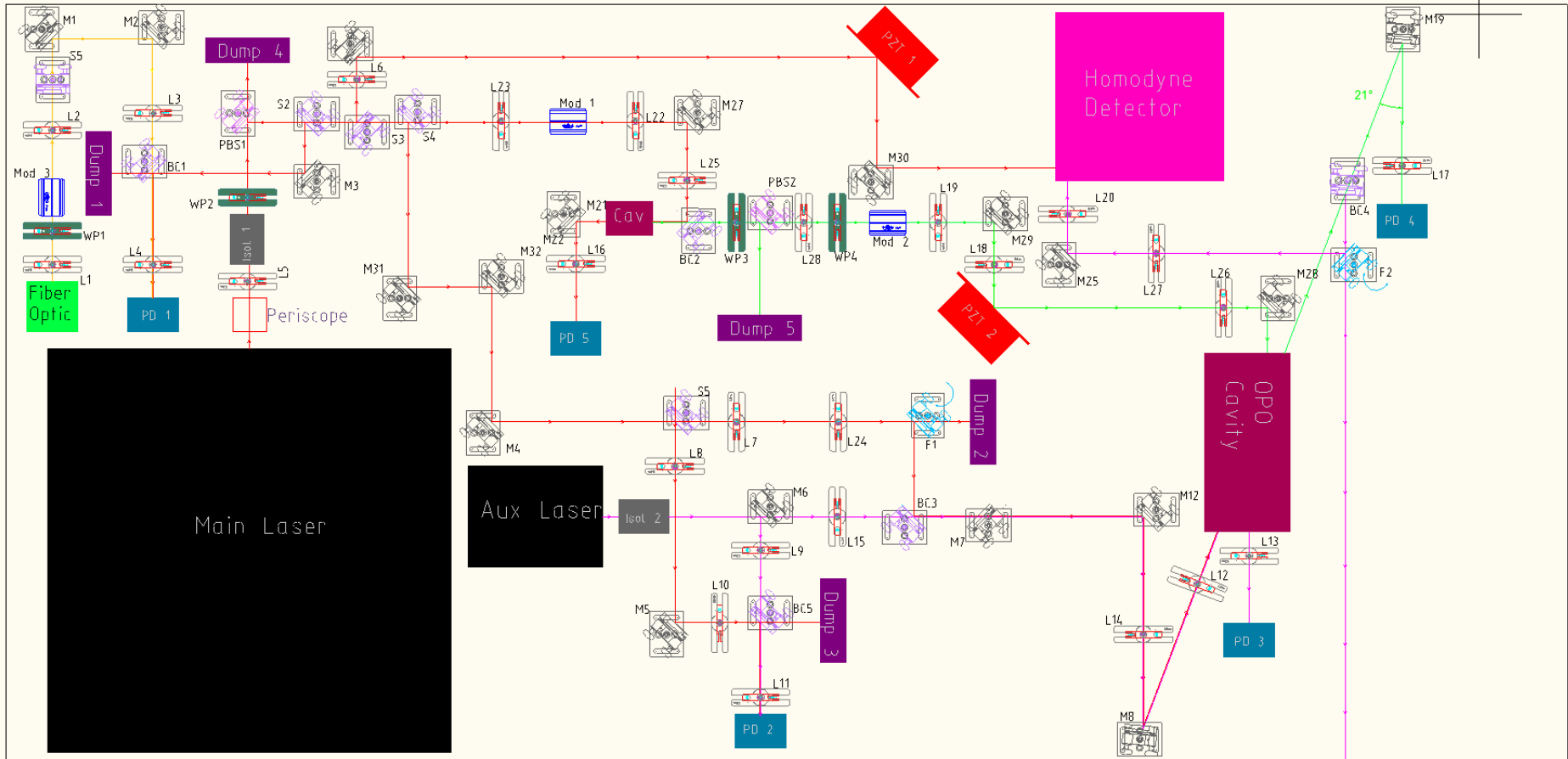
Electronics

- + *Mains harmonics*
- ▲ *Cross coupling from Coherent Lock*
- *Electronic Noise?*

Lab environment

- *Acoustic Noise*

Optical Layout



Schedule

- ❑ ANU/OPO well on track
- ❑ Noise model (remaining action item from review) will be completed in a ~month
- ❑ AEI homodyne detector will be shipped to ANU ahead of schedule
- ❑ Assembly at MIT
 - Optical layout on track
 - Parts late by ~2 months (initial funds almost exhausted)
- ❑ Electronics production at LHO
 - Design on track
 - Procurement late by ~2 months (person power & money & H2 unavailable)

Plan

- ❑ Need to get the next review done!
 - Funding is now becoming the holdup
- ❑ Need get some additional resources for
 - Electronics production at LHO
 - Setup at MIT
 - Procurement
- ❑ ANU will continue on development of OPO
 - On track for 2010 delivery
- ❑ Setup at MIT will continue with SHG & laser locking
- ❑ Electronics production can go forward for RF, photodetectors, TFFFS and length servos

Summary

- ❑ Impressive progress on the OPO
- ❑ Setup at MIT is coming along
- ❑ No major roadblocks so far
- ❑ More funding is needed in a very short time
- ❑ Some additional person-power is required at MIT and LHO for the second half of this year