



Squeezer Update Review

February 9, 2010

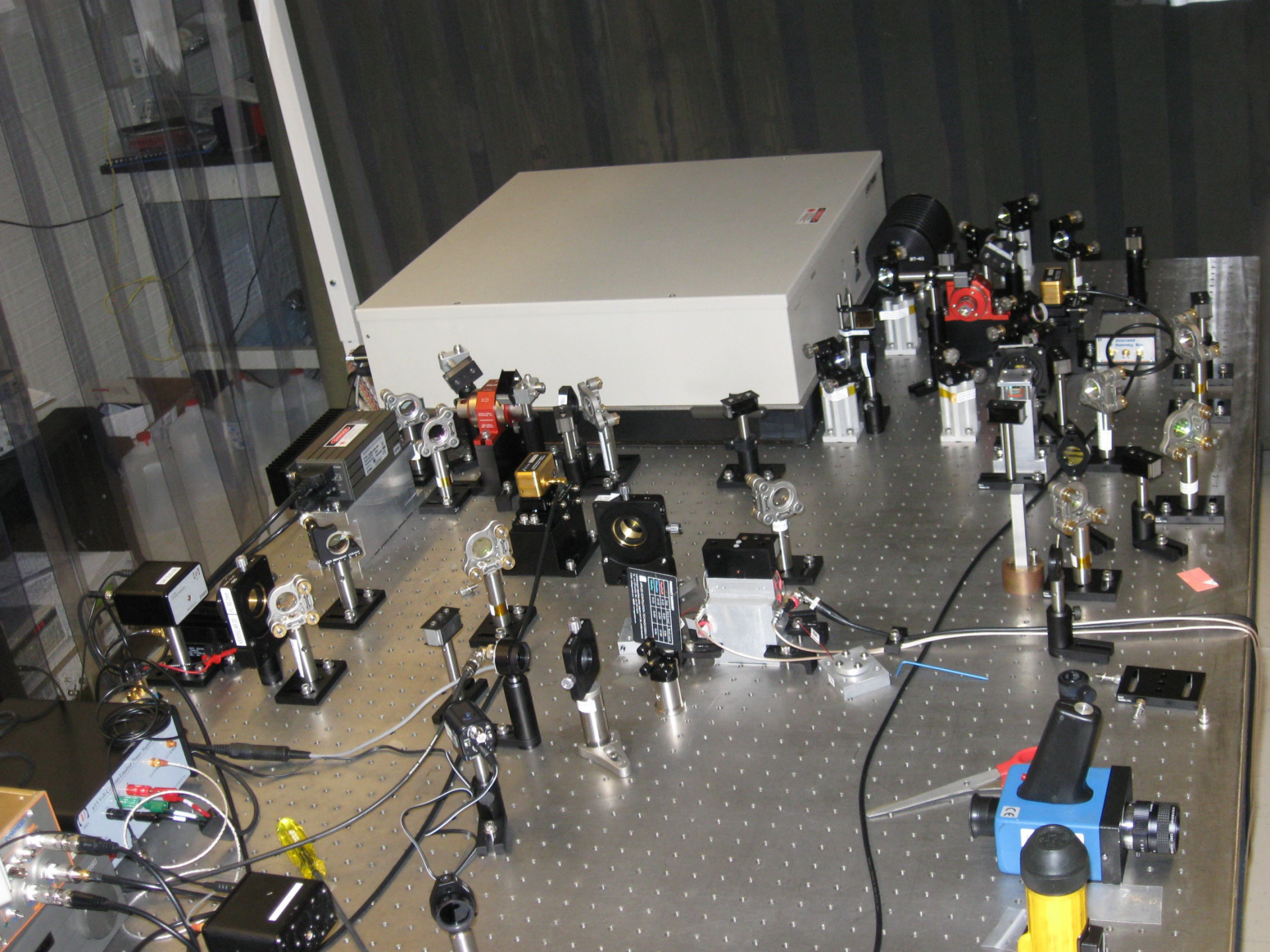
H1 Squeezer Experiment

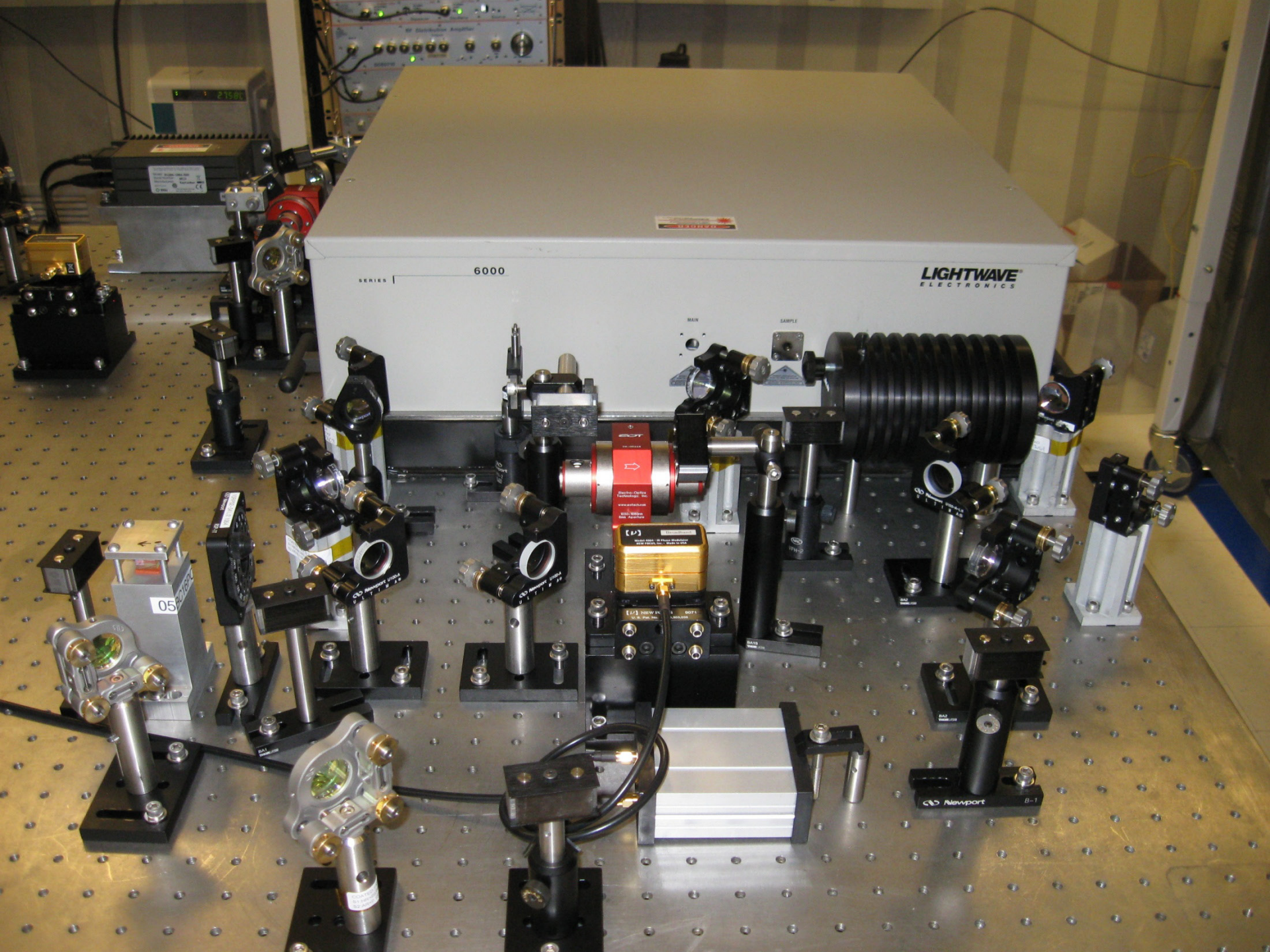
ANU, AEI, MIT, CIT and LHO collaboration

Highlights

- ❑ New postdoc: Lisa B.
- ❑ ANU OPO development
 - Ready to ship (schedule says March 2010).
 - Traveling wave bowtie design works.
 - Grad. students will travel to MIT to set it up.
- ❑ LHO
 - RF electronics: built, 50% installed, working.
 - TTFSS for laser locking: built, installed, working.
 - Demodulator design by Rich A., 1st unit in hand, working.
 - Servo board (CM): 2 units built, ready for testing.
 - Slow controls (Beckhoff): 1 unit built, working.

Completion expected: May 2010.
- ❑ MIT
 - Lasers fully operational, locked with 1MHz bandwidth.
 - Optics ordered for SHG mirrors, HR mirrors, beam splitters, dichroics.





SERIES 6000

LIGHTWAVE ELECTRONICS

MAIN

SAMPLE

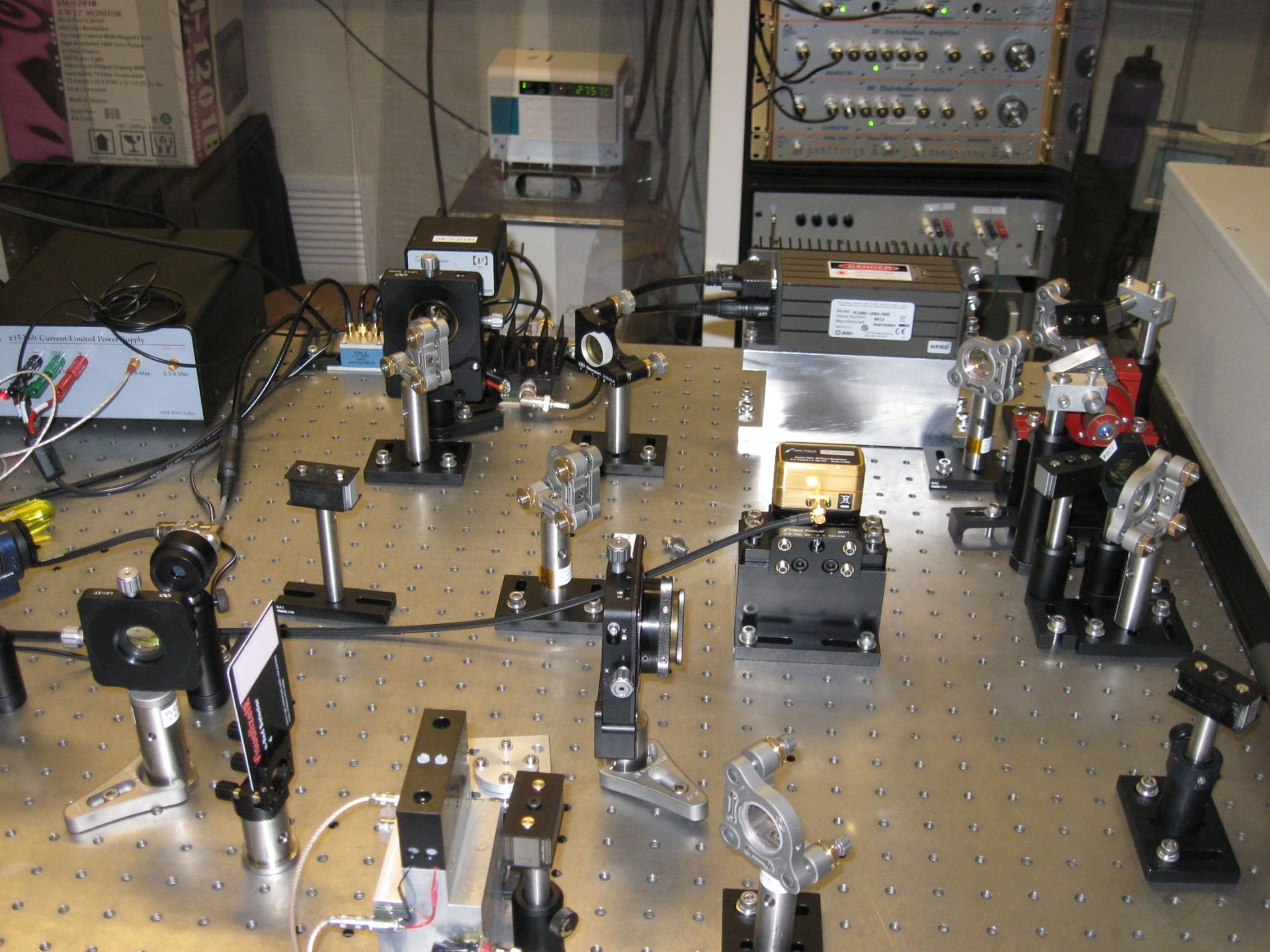
APC

12V

12V

05

Newport B-1

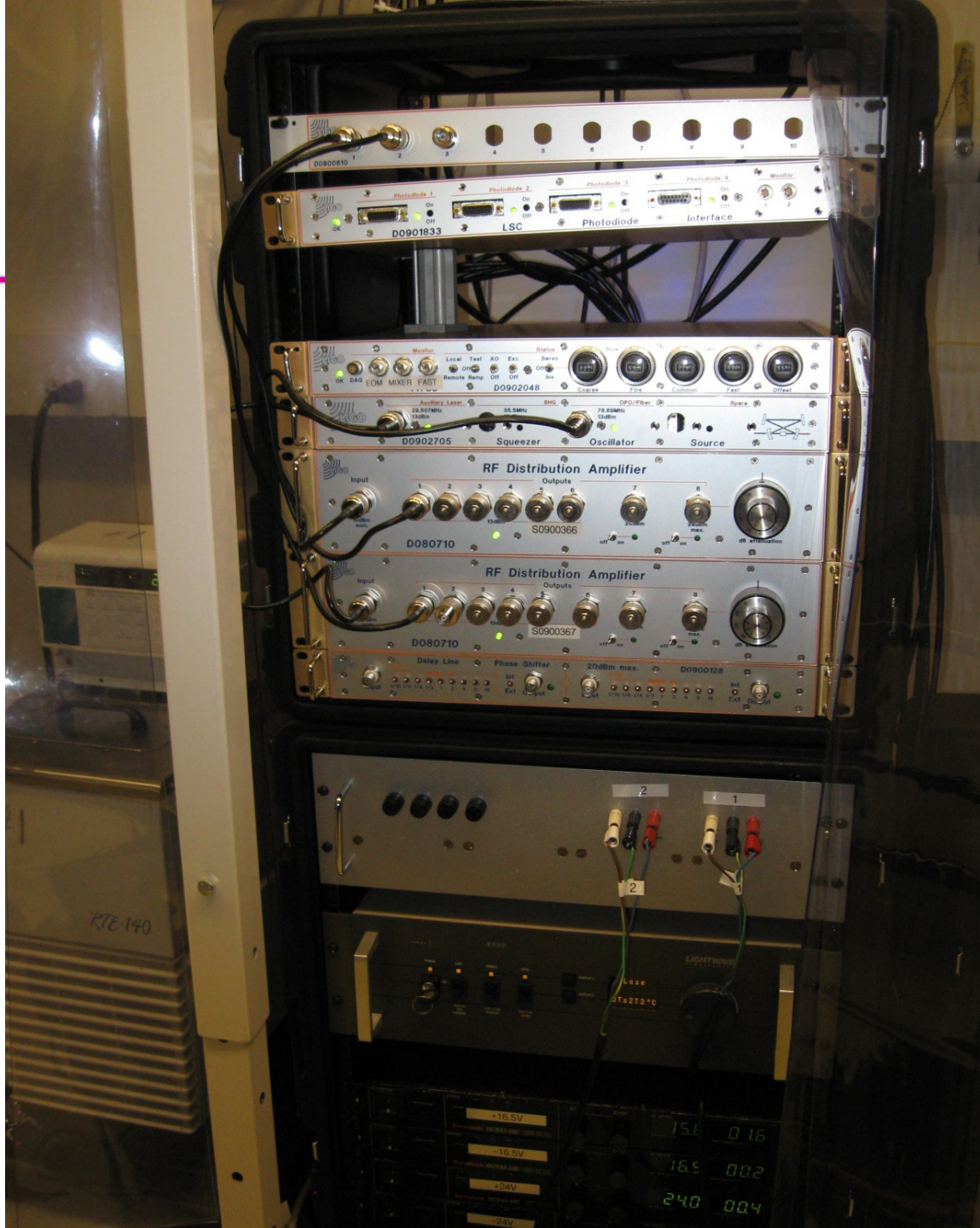


215Volt Current-Limited Power Supply
0.3A Max

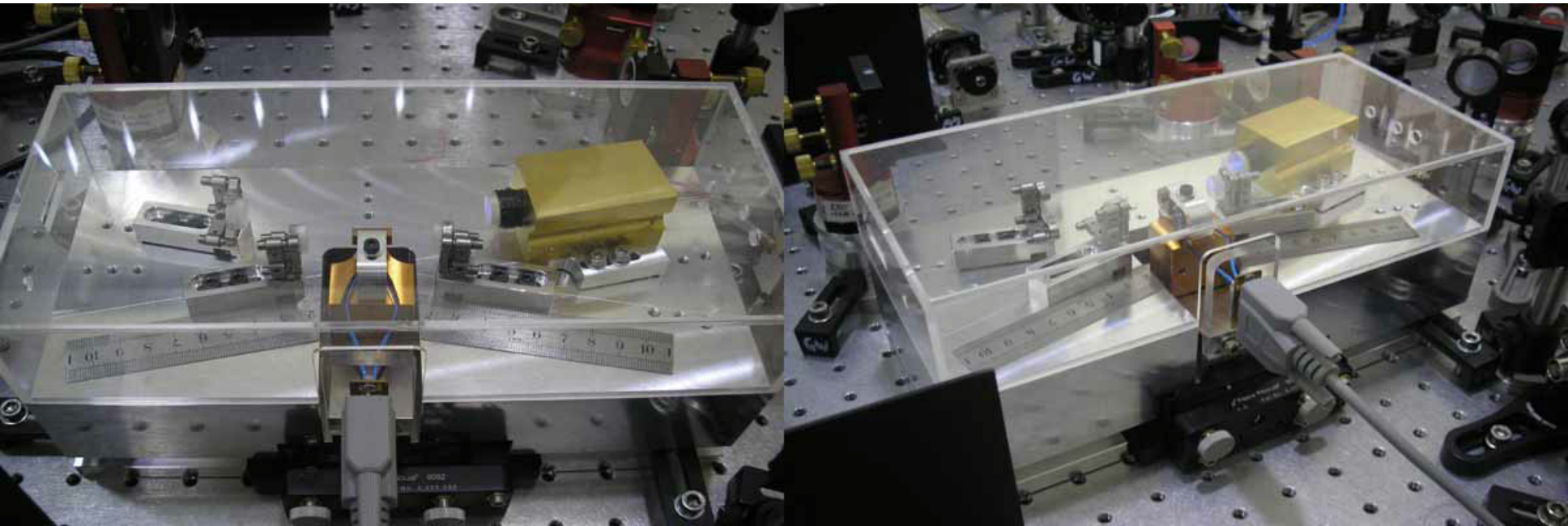
2.75V

Model: KL200-1004-000
Serial Number: 8813
Manufactured: 10/10/00
O: BNU
NPRD

RF Distribution Amplifier

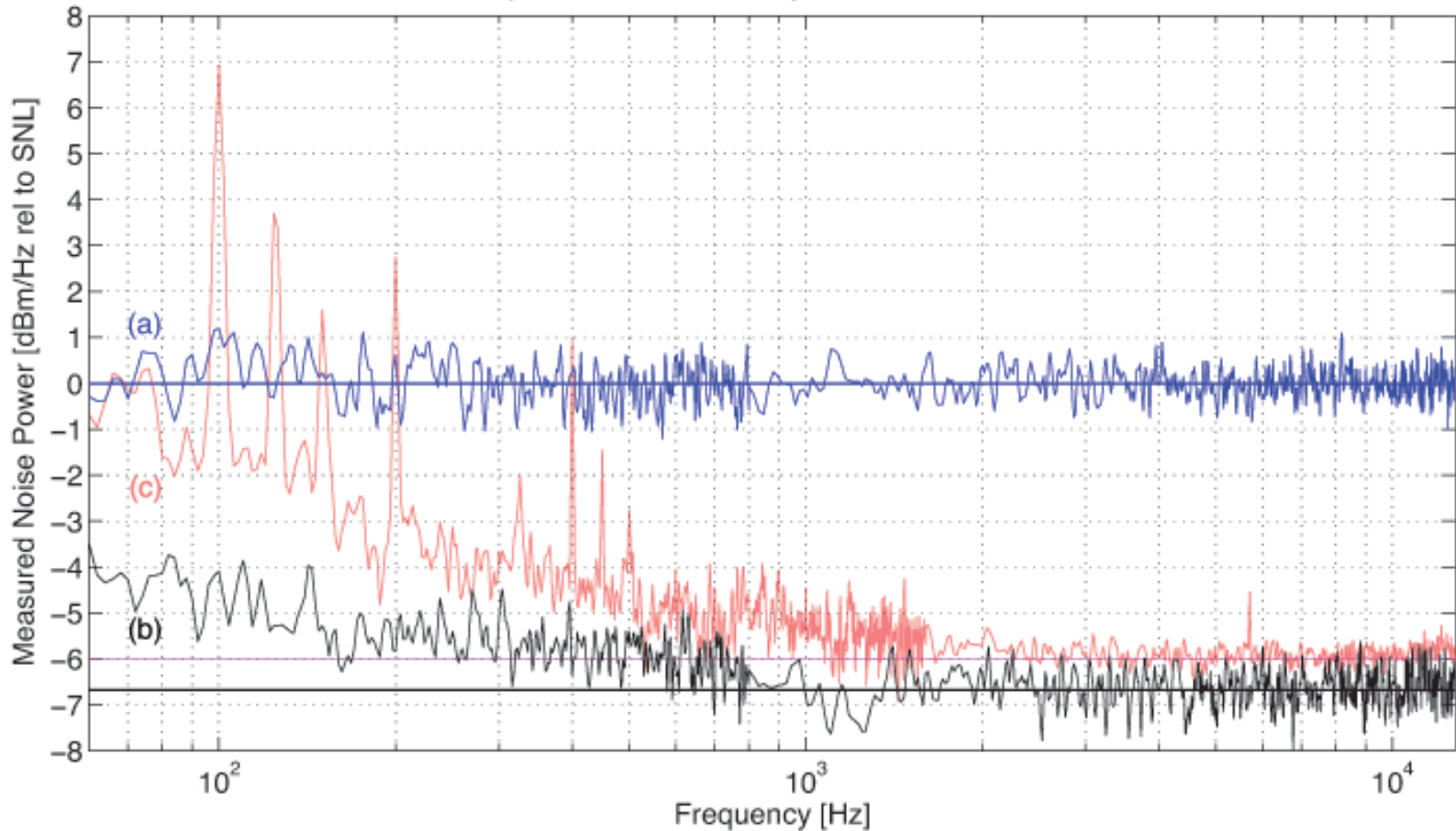


ANU Traveling wave OPO

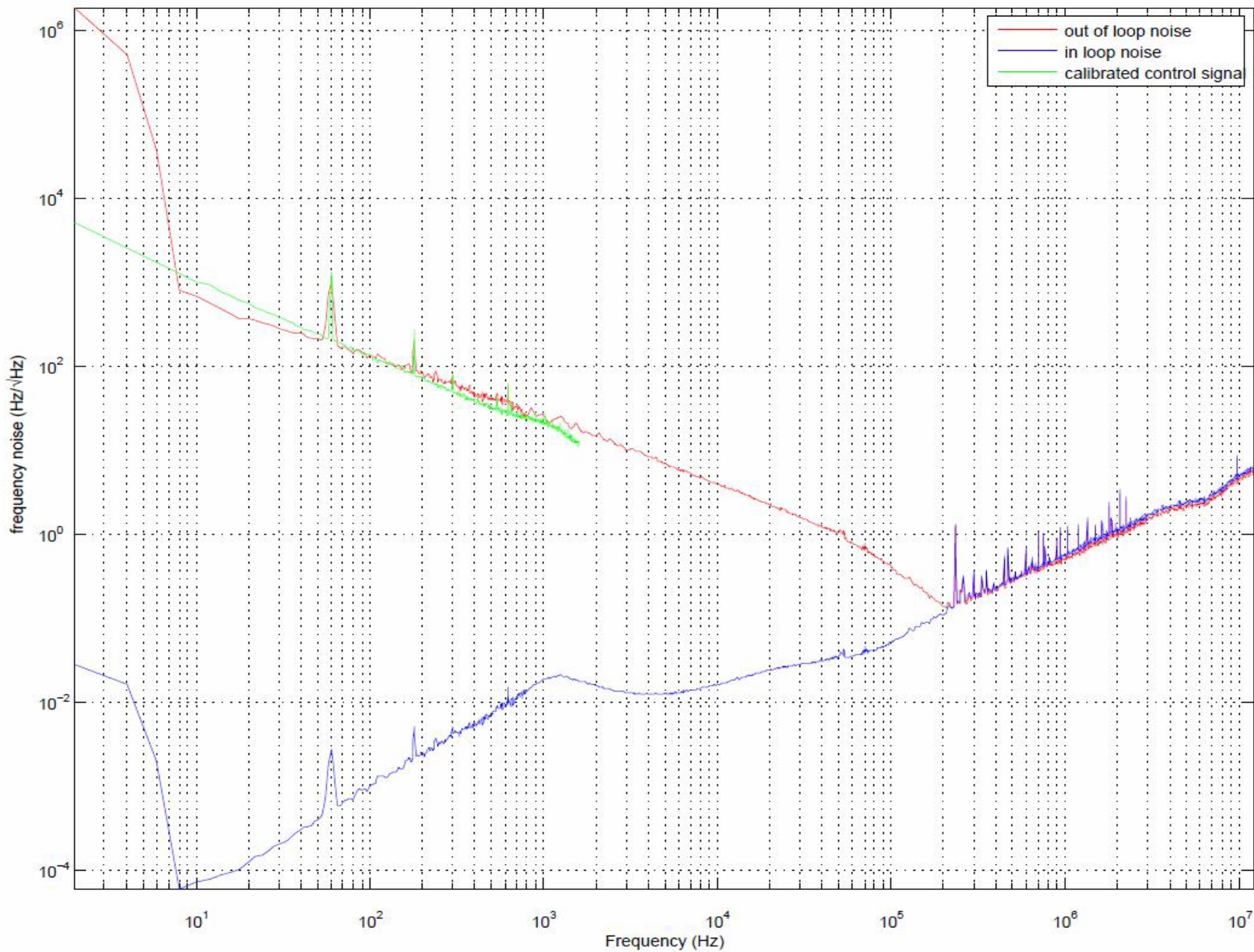


OPO Performance

Comparison – 14th January 2010 to Amaldi 8 Data



full frequency noise (slightly fudged)



Previously

- ❑ Grad. students Sheila D. (MIT), Sheon C. (ANU) and Michael S. (ANU)
- ❑ OPO development at ANU
 - 6 dB of squeezing observed, traveling wave bowtie design works
- ❑ AEI loaner SHG at MIT
- ❑ Noise model and simulation completed
 - Showed we can eliminate fiber stabilization
 - All network compensation filters are designed
 - No show stopper

Schedule

- ❑ OPO development at ANU basically completed on schedule
- ❑ AEI homodyne detector at ANU
- ❑ Noise model completed
- ❑ Assembly at MIT
 - Lasers, laser locking done
 - Optics procurement about ~2 months late
 - OPO integration will be about ~2 months late (will start May 2010)
- ❑ Electronics production at LHO
 - About 80% complete, on schedule to complete May 2010

Plan

- ❑ Continue to test AEI SHG
Built our own when we get the optics
- ❑ OPO to arrive in May 2010
 - OPO integration will start immediately afterwards
- ❑ Electronics production will wrap up in May 2010
- ❑ Advanced LIGO Faraday isolator (Mike S.)
assembled by June 2010
- ❑ Need to start thinking about in-vacuum work
- ❑ Initial funding (210k) is exhausted

Budget Request

Task	Remainder	FY10: Q3/Q4
Electronics	55k	55k
Remote beam alignment	25k	0k
Remaining optics (e.g., lenses)	50k	50k
OPO super polished optics	25k	25k
In-vacuum stuff (excl. Faraday)	10k	10k
Travel	60k	20k
Total	225k	160k

Past request: 210k (all spent and committed by end of January)

Original request: 430k total

Summary

- ❑ Lasers and OPO ready
- ❑ Electronics is nearing completion
- ❑ No major roadblocks so far
- ❑ More funding is required now
- ❑ On budget & on schedule