

Status of LLO PSL

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- General Performance
- Pre-Mode Cleaner
- Intensity Noise
- Frequency Noise
- Future

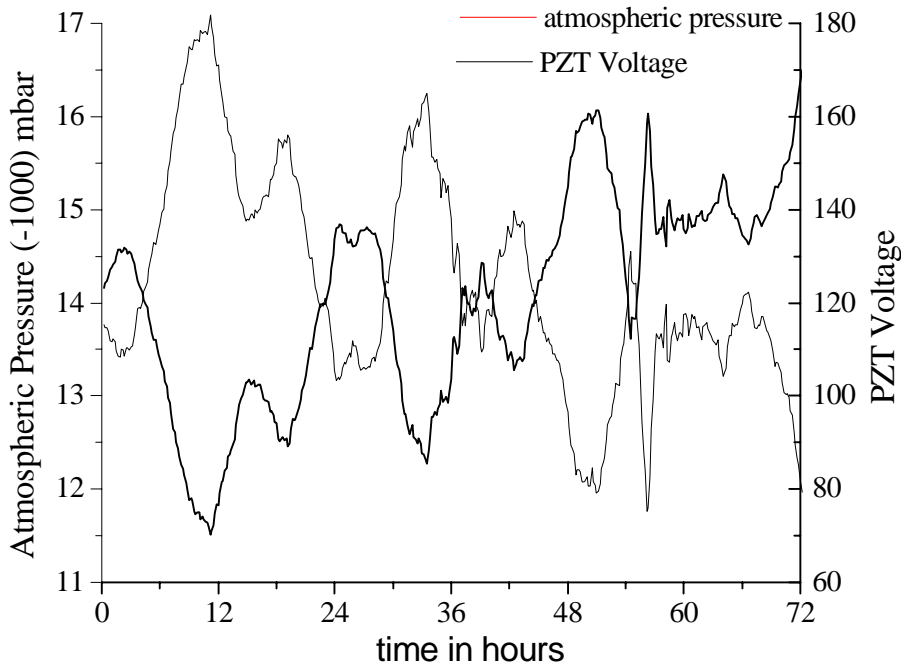
General Performance of PSL

- Master Oscillator Power Amplifier (MOPA) in almost continuous operation from 08/99-02/01
- Laser output power slowly degraded over time
 - Laser power decreased from 10W to 3W
 - NPRO pump power decreased from 500 mW to 50mW
 - NPRO noise performance degraded-frequency spikes and mode hopping
 - With NPRO replacement –current output ~6.75 W
- Improvements made to Frequency Stabilization Servo
- Improvements made to Pre-Mode Cleaner
- Changes made to mirror mounts to reduce frequency noise
 - Ongoing table configuration improvements

Pre-Mode Cleaner Changes

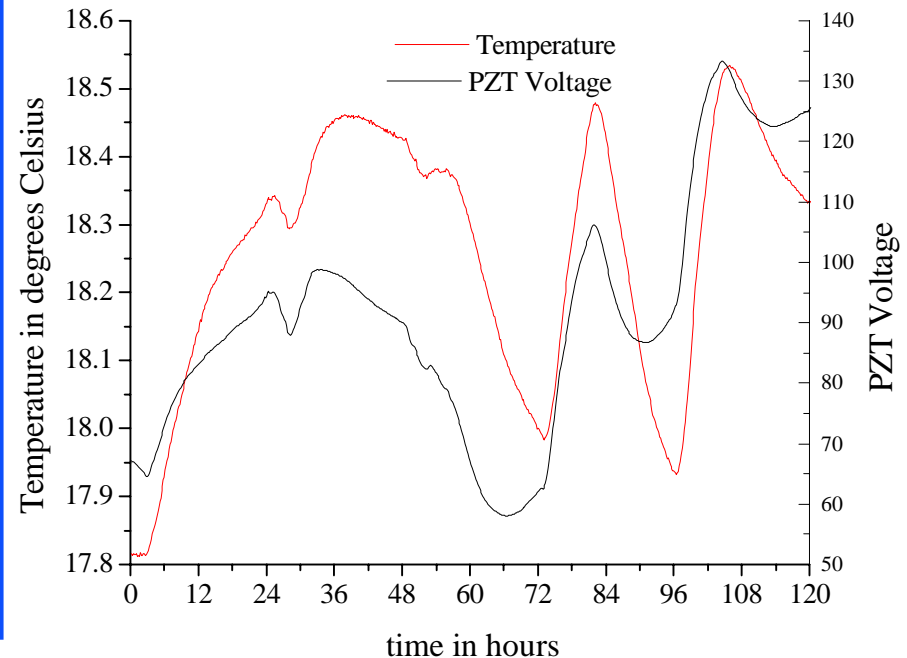
Old Pre-Mode Cleaner

- ~75% Throughput
- 5.5 MHz bandwidth
- Epoxied at discrete points
- Open to atmosphere

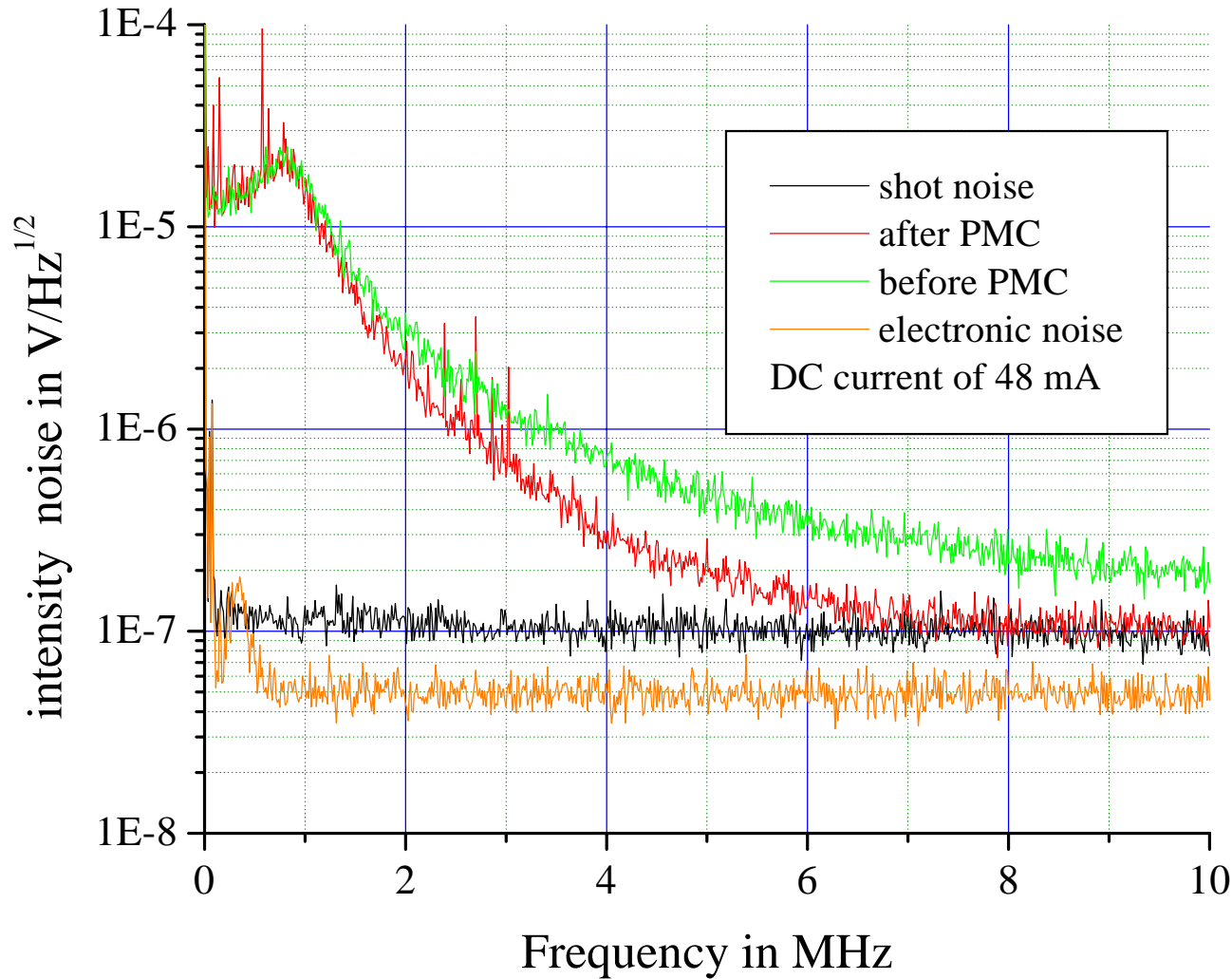


New Pre-Mode Cleaner

- ~65% Throughput
- 4.5 MHz bandwidth
- Optically Cemented
 - Higher body resonance
- Hermetically sealed

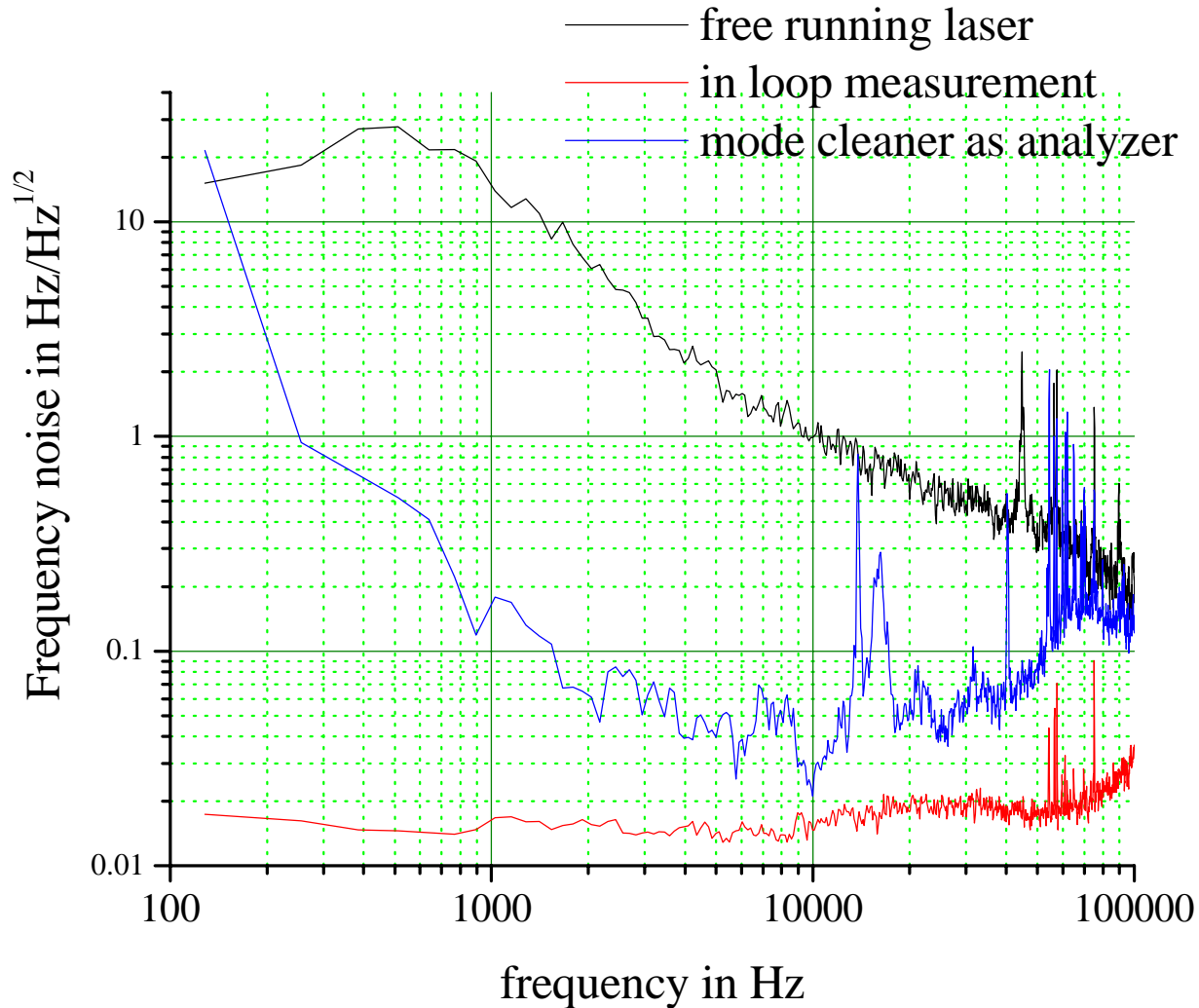


Intensity Noise



- Old Pre-Mode Cleaner
- Old Laser

Frequency Noise



Mirror Mounts



New Focus Centre
840 Hz ???



New Focus Corner
840 Hz ???



Newport Ultima 100 (“open”) with 1” post
-580 Hz



Opto Sigma Ultra Stable
400 Hz



Fixed Periscope
610 Hz



Fixed “Sovietski”
1.4 kHz



Ultima 100
with pyramid base
590 Hz



Ultima AC (“closed”) with pyramid base
850 Hz



Micro Controle
730 Hz

- Intensity Stabilization (ISS) must still be implemented
- Tidal servo must still be implemented
- New table layout
- Study acoustic environment