



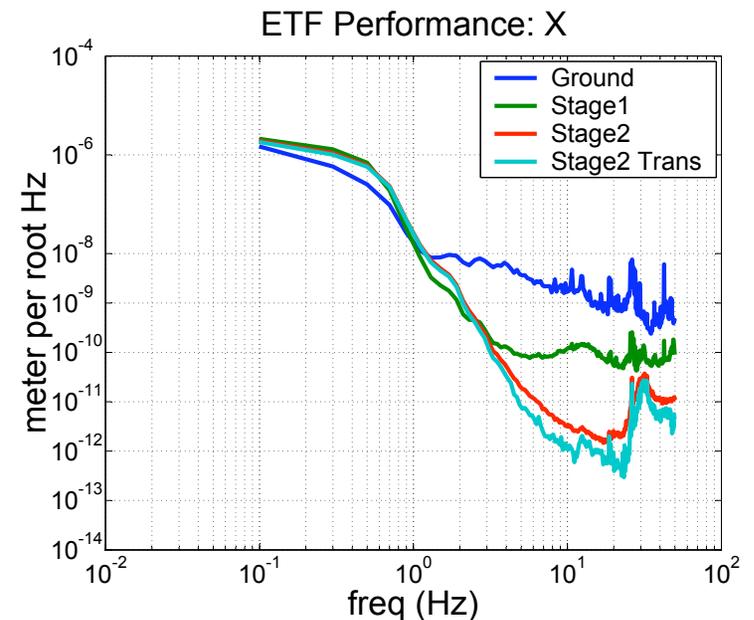
SWG Meeting Summary

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Technical Plenary Talks: Adv LIGO design status

- Dennis Coyne described the current Advanced LIGO optical layout.
 - ▶ Highly constrained by table height clearances and seismic stay-away zones. The two-interferometer configuration at LHO particularly difficult.
 - ▶ Thermal compensation plates to be included as lowest mass in ITM reaction chain.
 - ▶ Non-wedged, vertical and horizontal wedged optics being considered.
- Caroline Cantley brought us up to date on the Adv LIGO suspension development in the US and UK.
 - ▶ Controls prototypes for testing at Caltech and LASTI, MC triple in June '04, and the first quad by mid-winter.
 - ▶ Design of suspension tower a structural stiffness and weight challenge.
 - ▶ Detailed designs of suspension ear, eddy current damping, ribbon pulling/welding, and OSEMs underway.

- Brian Lantz detailed the Adv LIGO seismic isolation progress.
 - ▶ The quiet hydraulic external actuation system (a.k.a., HEPI) has graduated from Stanford, took some post-grad classes at MIT, and got a real job at LLO.
 - ▶ Early results from the two-stage in-vacuum isolation platform tech demo experiment at the ETF are very promising; factor of 300–1000 isolation seen.
 - ▶ Intensive design work underway for LASTI SEI prototypes.
 - ▣ Mech engineering contractor, ASI, and SEI team adjusting stiffness and CG requirements as joint SEI/SUS payload models are examined.
 - ▣ Sensor encapsulation and actuator vacuum compatibility issues being worked out.



SWG session talks

- Justin Greenhalgh and Ian Wilmot described work at RAL to design and test the SUS blade springs. “The blade committee.”
- Stuart Aston covered the low-noise OSEM development work in Birmingham and Strathclyde, including high-power LED designs and a novel interferometer sensor that has a 3 mm range and a noise floor of $5 \times 10^{-13} \text{ m}/\sqrt{\text{Hz}}$.
- Norna Robertson, Janeen Romie and Calum Torrie detailed the various versions of the suspension design and progress towards producing prototypes. As with the SEI design, stiffness and weight are issues. At the moment, a complete quad with reaction chain is 418 kg.
- Mike Plissi described experimental and modelling work done in designing eddy current dampers that may be used for several of the triple and quad’s modes.

Test mass charging session

- Greg Harry introduced the problem, which is that insulated suspended optics can be charged, leading to damping, DC offsets, and excess noise.
- Eoin Elliffe described work at Glasgow to dope silica sapphire with Lithium ions to increase conductivity.
- V. Mitrofanov outlined MSU experimental results showing long-term charging and rare jumps of charge in a suspended optic, using a Kelvin probe and displacement sensors.
- Dave Ottaway reminded us of the initial LIGO bad experiences with Viton and metal optic stops, as well as uncharging that happens upon venting.
- More measurements and discharge techniques needed.