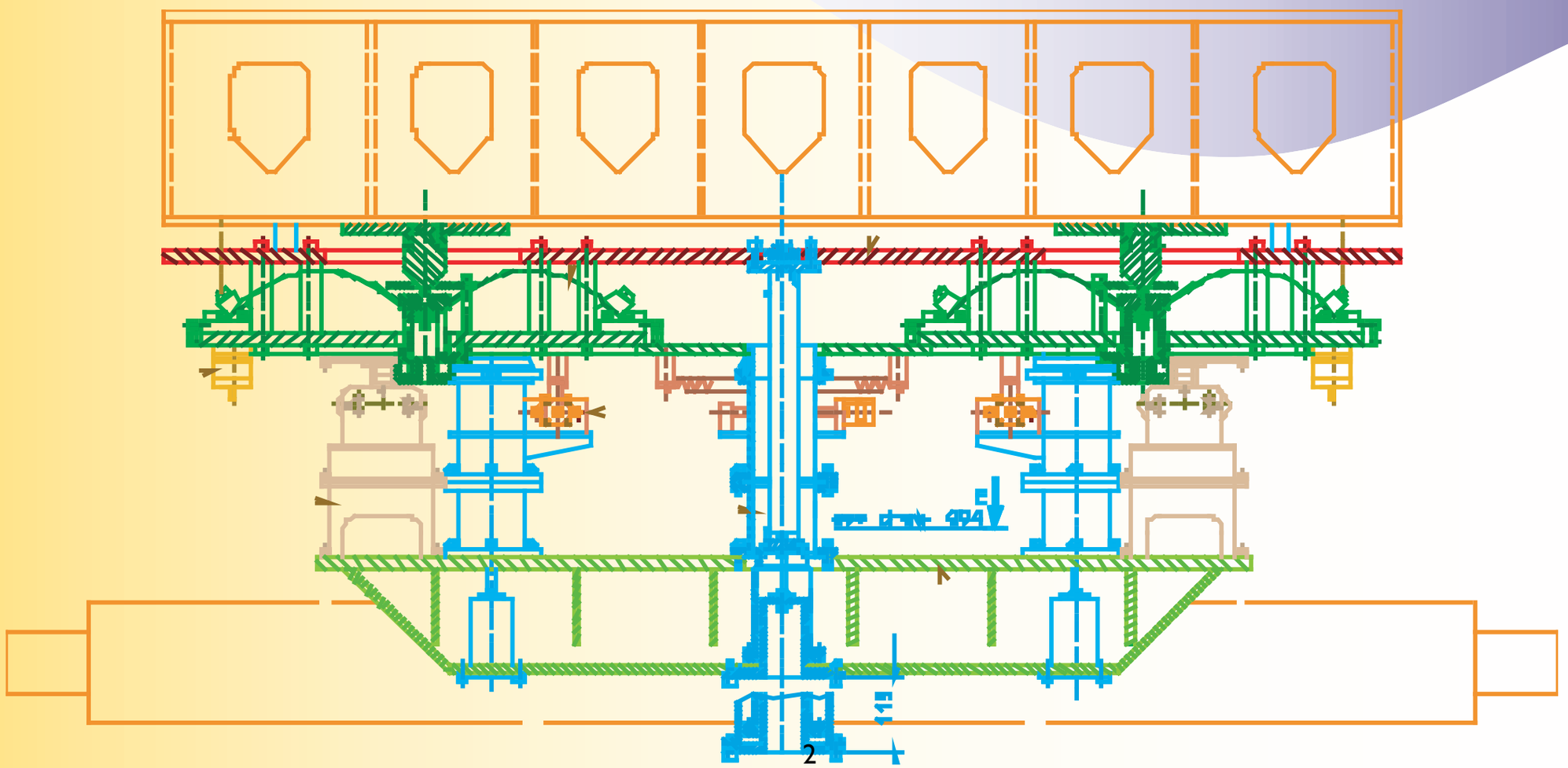
SWG Update

17 August 2005 LSC meeting, Hanford.

J. Giaime, LSU. G050449-00-R

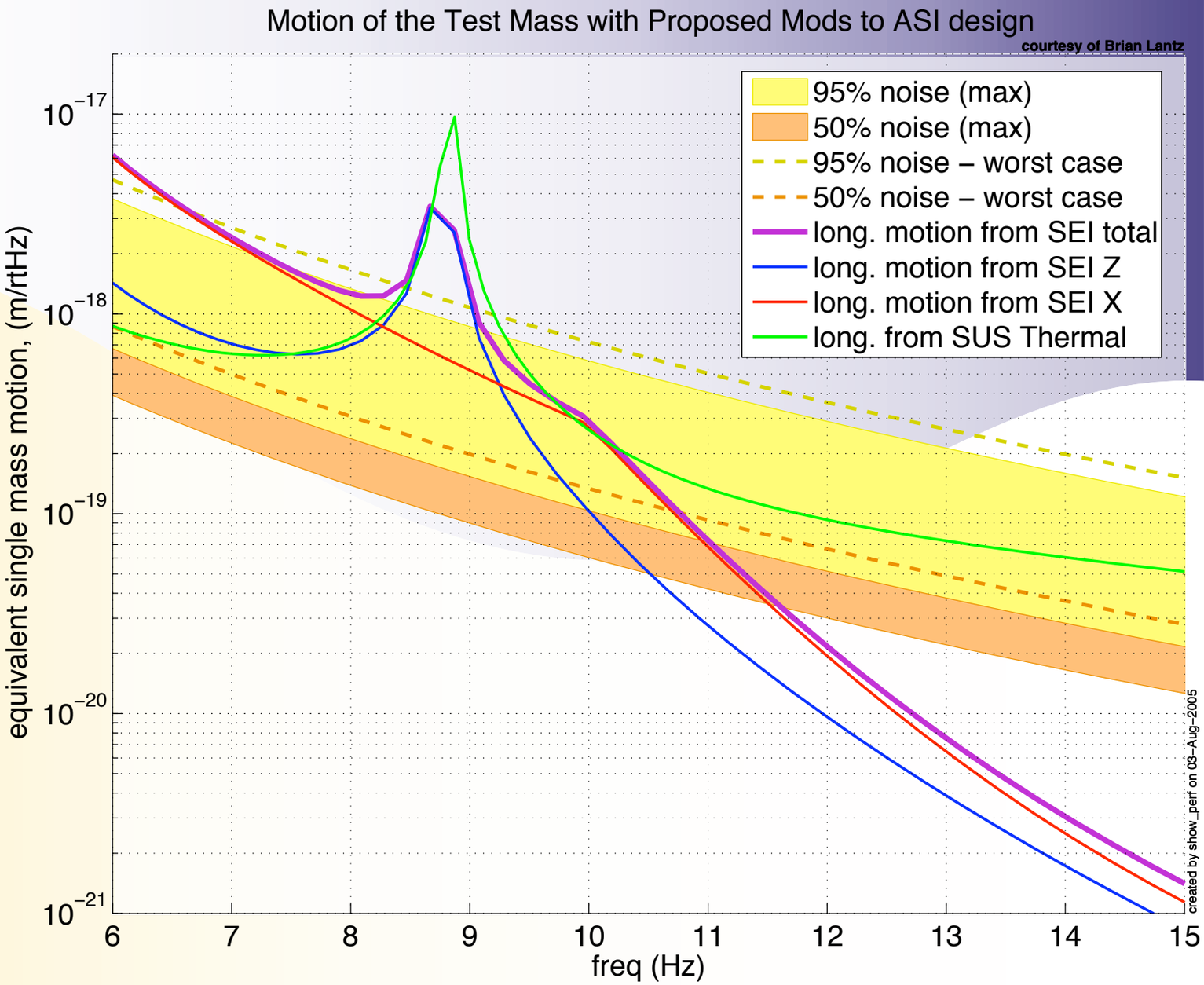
Seismic Isolation

- Riccardo DeSalvo presented a design as a substitute for the baseline Adv LIGO (and LIGO-I OMC) **HAM** seismic isolation, proposed to be built and tested at LASTI.
  - horizontal isolation from inverted pendulum; compact version has been tested in the lab. Feedback to LVDTs for drift control.
  - vertical isolation from new arrangement of GAS units that would support existing HAM optics table. Parasitic tuning springs, and negative spring from feedback from LVDTs to voice coil actuators, which also control drift. Required control bandwidth under study.



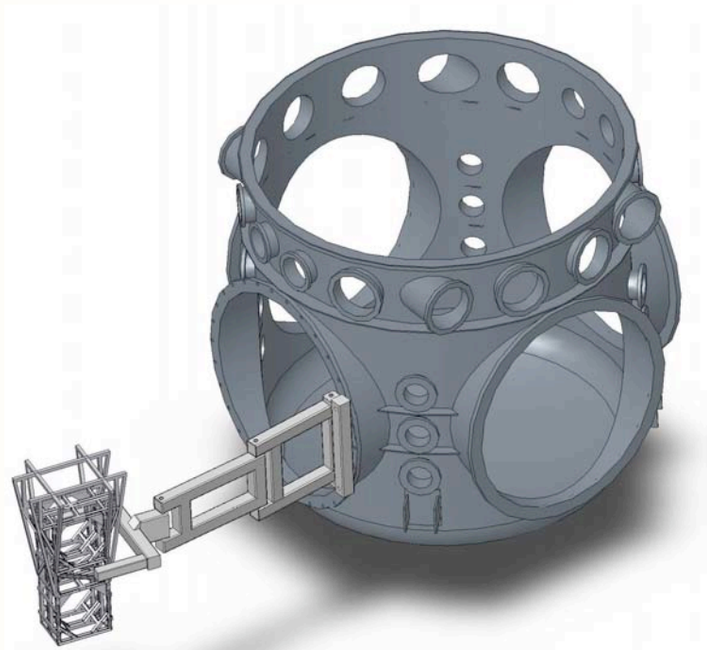
Seismic Isolation, continued

- Brian Lantz presented an update on the Adv LIGO **BSC** seismic isolation development.
  - Technology demonstrator in Stanford ETF is operating with good performance, with all noise levels explained by the model.
    - 1 Hz performance limited by GS-13 geophone's preamp; new "standard" design should allow Adv LIGO required perf.
    - 10 Hz performance limited by too-stiff blade springs; Adv LIGO prototype design modified to avoid this in LASTI test. Also, side-to-side resonance of BSC vacuum chamber couples energy at about 10 Hz to external SEI structure, making higher-than-expected disturbance.
    - LASTI version should provide good performance for Adv LIGO



Suspensions Research

- Norna Robertson's talk updated us on various aspects of the Adv LIGO suspension research.
  - **Controls** prototype parts being assembled, including lightweighted lower caging assembly, drum-end maraging steel wires, and installation arm.
    - To be tested soon at LASTI, supported on HEPI using 'dummy' optics table (i.e., no Adv LIGO SEI)
  - Work towards **Noise** prototype well underway (mostly) in the U.K., for installation next year under SEI BSC prototype at LASTI.
    - OSEM development, passed form/fit/function test
    - mechanical design work, including provision for compensation plate, and accomodation of sapphire backup substrate.
    - Electronics front ends.



Suspensions Research, continued

- Talk by Alastair Heptonstall on CO_2 laser-pulled fiber and ribbon development
  - until now, ribbon fibers have been made in an automated pulling machine using a Hydrogen - Oxygen flame. Dimensional errors largely attributed to flame variation.
  - CO_2 automated pulling machine has been tested, and will soon be improved further with independent control over feed and pull rates.
  - mechanical properties of ribbons made with both methods has been carried out, giving reasonable agreement with expectations and requirements.
  - design and testing of ears and welding using CO_2