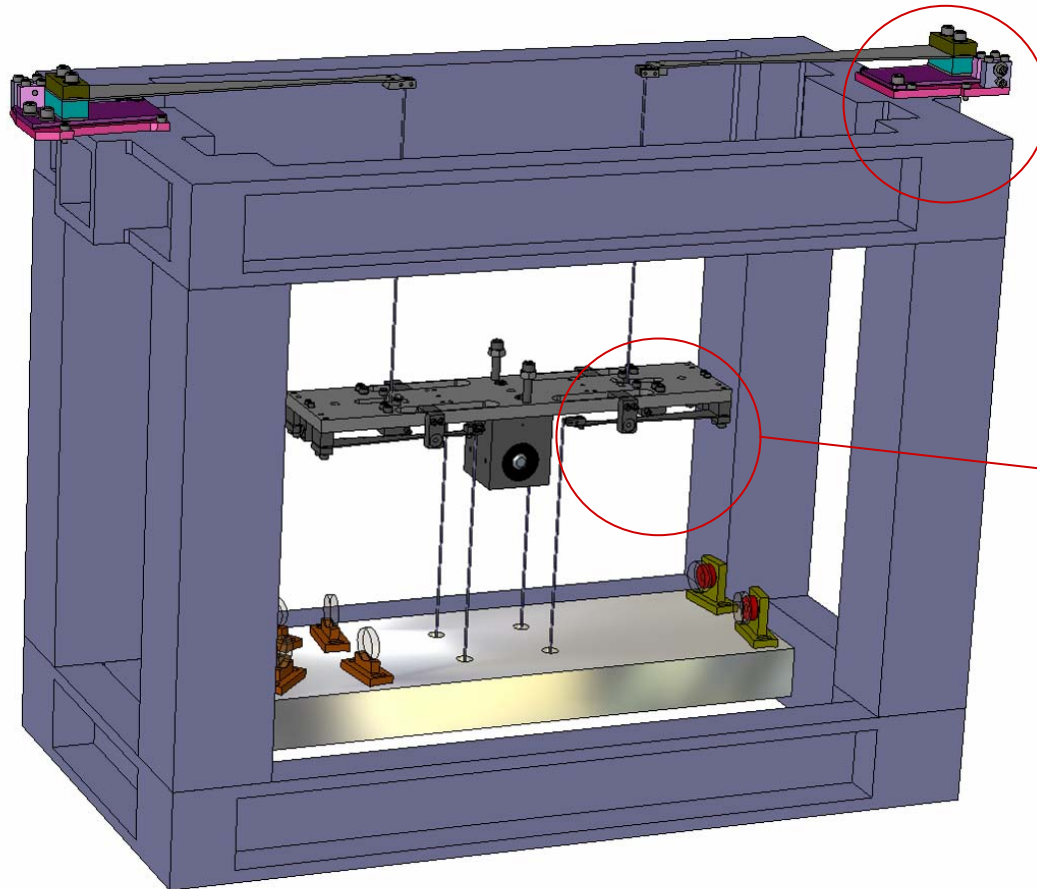


Output Mode Cleaner Concept

Calum I. Torrie & Chris Echols

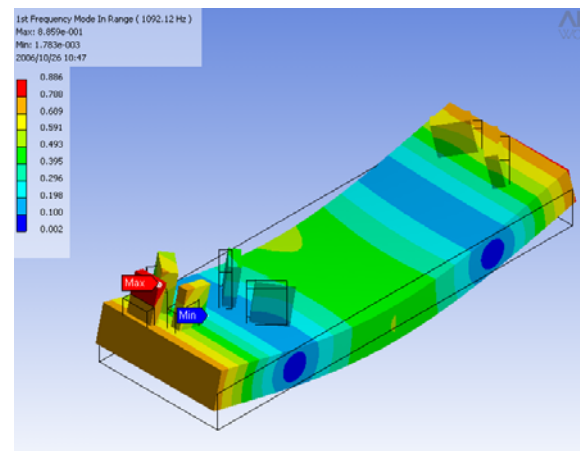
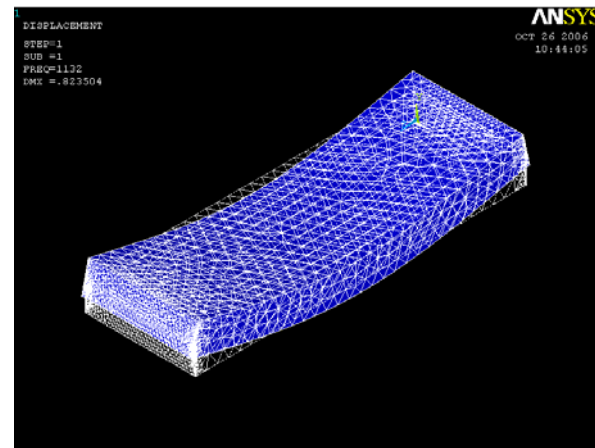


Notes for Chris:

- 1) Can you look at position of blade in LIGO-D060014-07?
- 2) No lower blades in prototype, can you update?

FEA: Optics Bench

- ANSYS & ANSYS Workbench
 - Dimensions 450mm x 150mm x 40mm
 - Modal analysis with free / free B.C.
 - Resonance and suspension point?
- Simple model in ANSYS
 - Fused silica, $f_1 \sim 1100$ Hz *
- Assembly model in ANSYS Workbench
 - Fused silica, $f_1 \sim 1100$ Hz *
- Sam's Assembly model
 - Aluminium + optics, $f_1 \sim$ TO DO
 - Fused silica, $f_1 \sim$ TO DO



* Ties up with Sam's calculation. Still to converge and look for best place to suspend from, Sam think you have you looked at this?

OMC Top Blades = IMC Top Blades

- The IMC Suspension
 - library of clamps, LIGO-D020677
 - Blade LIGO-D020205
 - Document [LIGO-T030125](#)
- Clamps
 - +/- 3.5 degrees (in 0.5 degree increments)
 - Up to +/- 500g per blade
 - Recommend optics bench defined as 6kg +/- 600g



FEA: OMC Structure

- ETM Controls Prototype has a welded structure modelled with this technique and verified with experiment

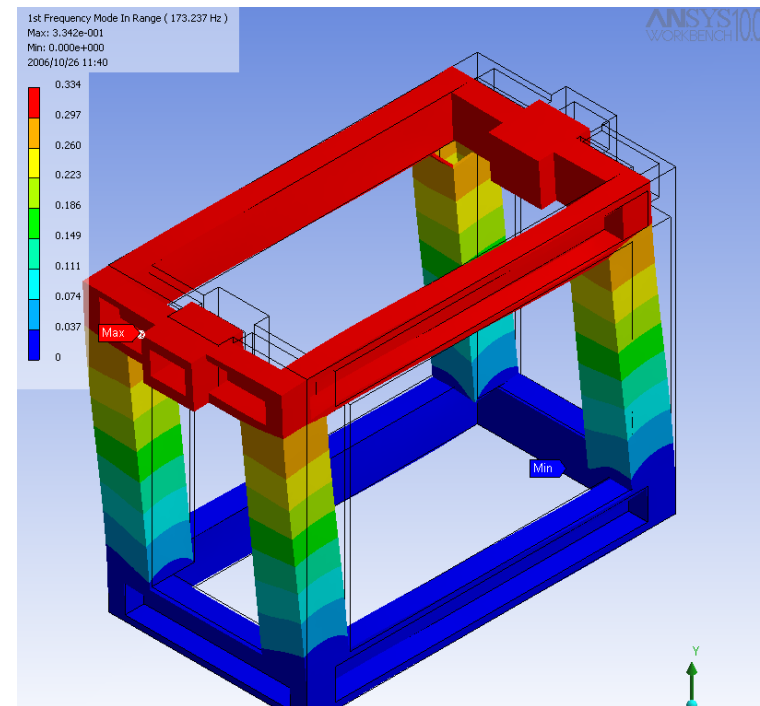
- ETM

- f_1 (model) \sim 220 Hz
- cf. f_1 (expt) \sim 200 Hz

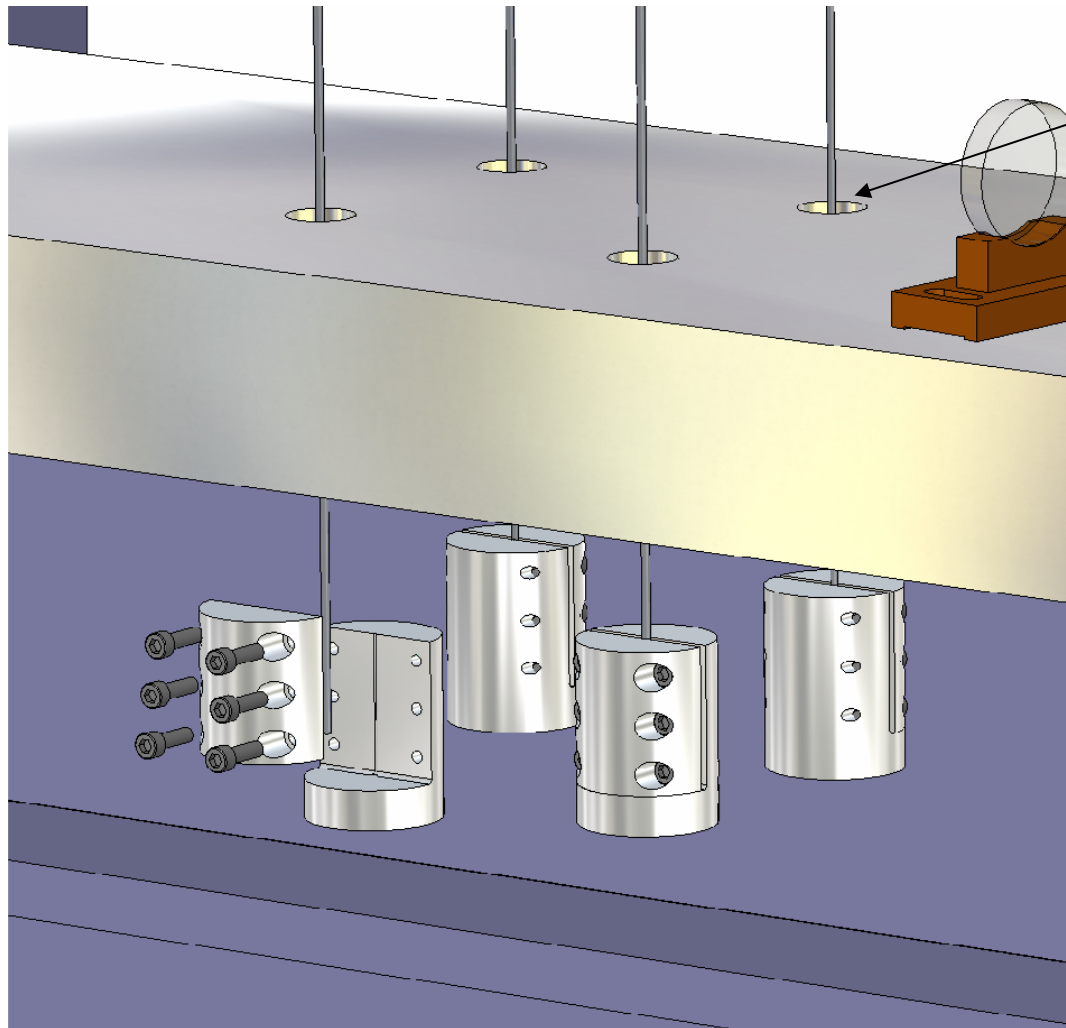
- OMC

- f_1 (model) = 175 Hz *

* Not as good as I first reported as now investigating in more detail wrt convergence and was previously clamping it at the top! (Should be able to stiffen by adding crossbars!)



Optics Bench Wire Clamps, Exploded View



Upper wire clamp passes through counterbore in optical bench

Wire with clamps (arranged on wire jig)

Optics Bench Wire Clamps, Exploded View (from underneath)

4 couterbore holes
machined in
glass (could
be done on
Ultrasonic
VMC)

