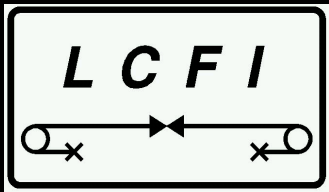


A 3D CAD model of a complex mechanical assembly, likely a detector component, rendered in a semi-transparent style. The assembly consists of various cylindrical, rectangular, and spherical parts, some colored in green, red, and blue. The model is set against a dark background with a faint grid pattern. The title text is overlaid on the central part of the model.

Overview of LCFI Mechanical Studies

Joel Goldstein
University of Bristol

ILC Vertex Detector Mechanics R&D Meeting
22nd May 2007

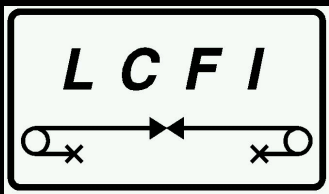


Programme



- Engineering and Prototyping
 - ▶ SiC and RVC foam ladders
 - ▶ Carbon fibre shell structures
- Cooling studies
 - ▶ Test rig
 - ▶ Compare with CFD tools
- Optimisation through simulation

Bristol
Liverpool
Oxford
RAL



Foam Ladders

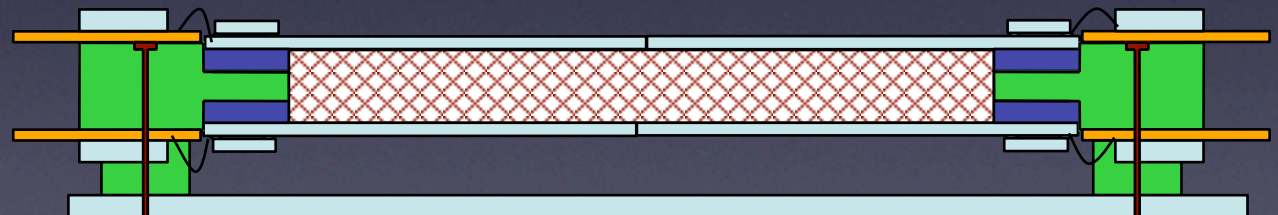
- 25 micron silicon on 1.5mm 8% SiC

- ▶ Very rigid
- ▶ 0.14% X_0

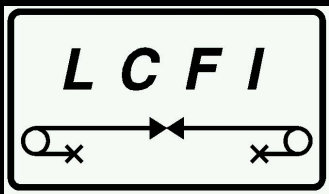


- 20 micron silicon sandwiching 1.5mm 2% carbon

- ▶ Could be double-sided
- ▶ 0.07% X_0



Affordable and reliable thinned silicon supplier

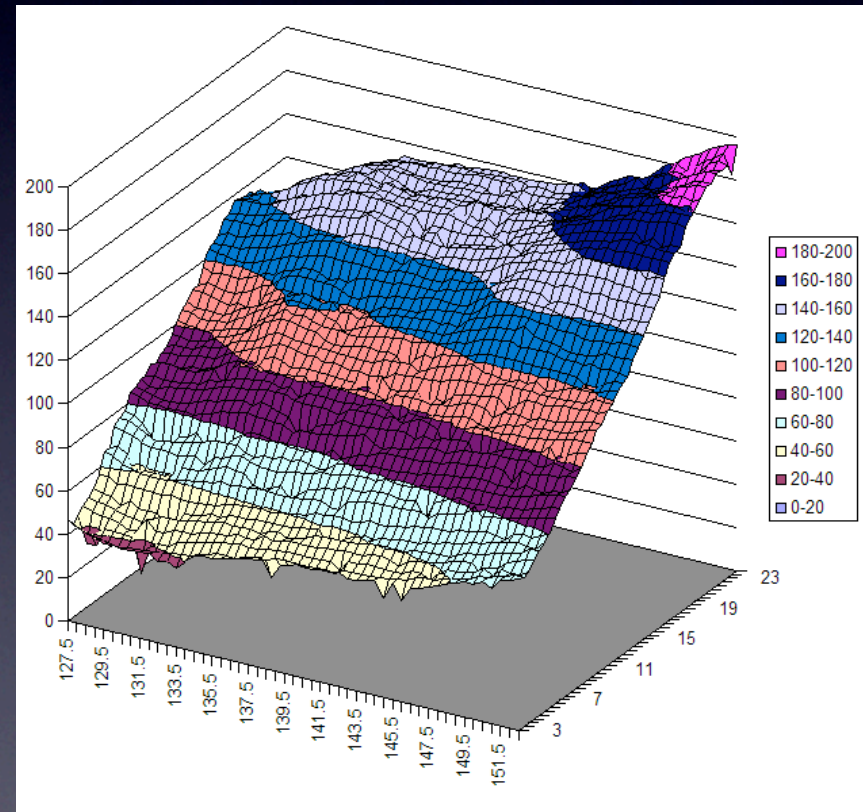


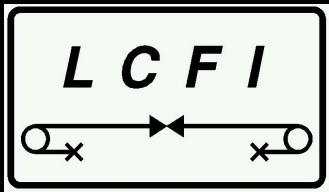
RAL Equipment



**EFD TT 525
Glue Robot**

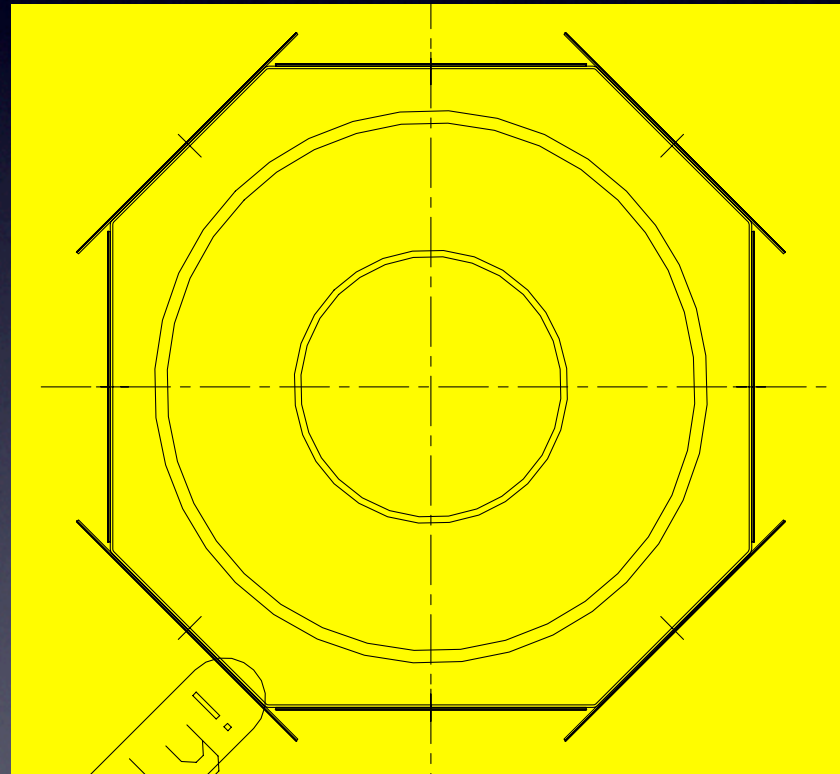
Cryogenic Metrology based on Keyence LK-3010M

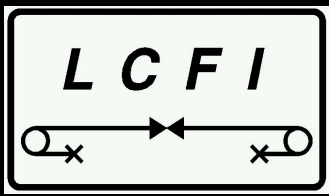




CF Shells

- Liverpool built CDF Layer00 shell
 - ▶ Prototype of 25cm long ILC structure

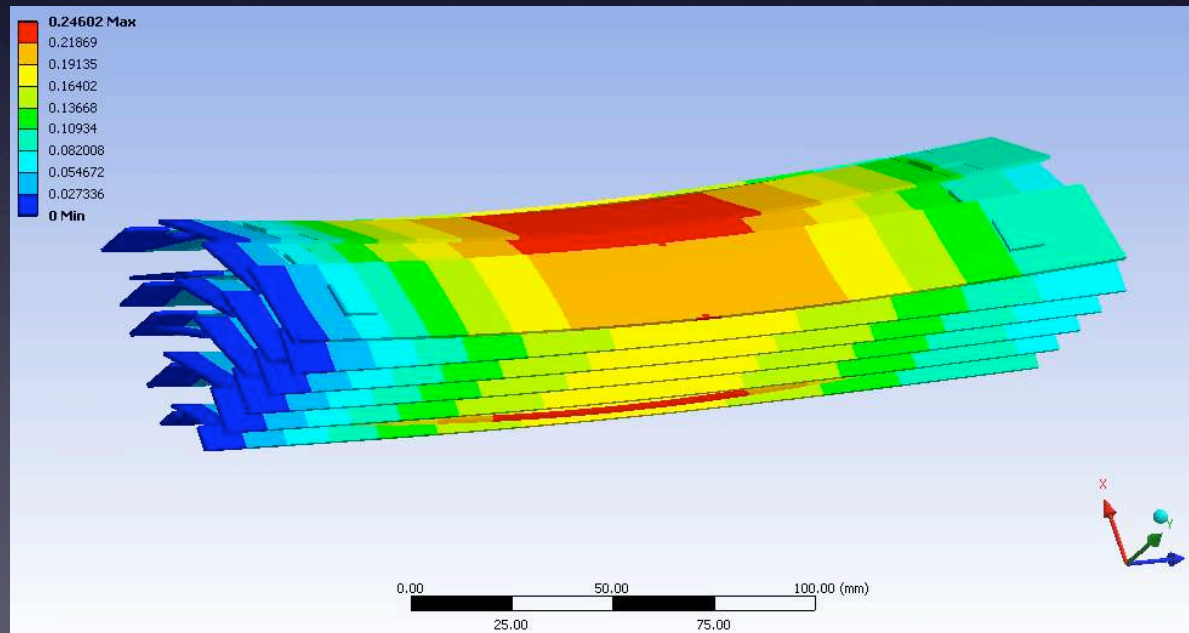
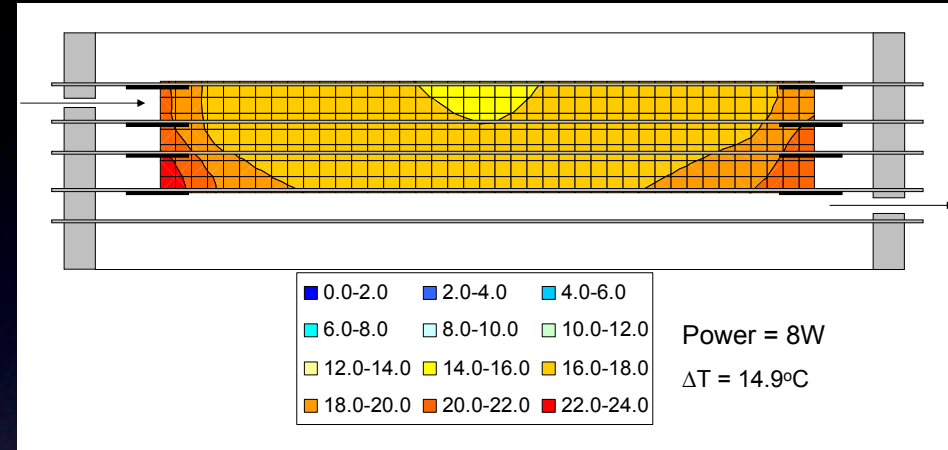


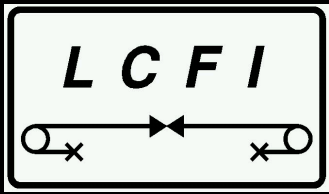


Cooling Studies



- Quarter-barrel mock up at RAL
- Calibrating CFD and FSI tools





Priorities



- Continue with foam prototyping and testing
 - ▶ Need lighter and flatter SiC samples
 - ▶ Analysing latest RVC prototypes
- First carbon fibre shell prototype
- Develop software optimisation tools