

**Brief Summary of Visit to LIGO (Caltech), November 9<sup>th</sup> – November 24<sup>th</sup> 2003**

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The main aims of this visit was to LIGO at the California Institute of Technology were to assist in the ongoing design and development of specific aspects of the Mode Cleaner (MC) Control Prototype, and also to become more familiar with my colleagues at Caltech and also their working environment.

The trip has definitely improved my knowledge and understanding of the project. This was the first time I have seen the MC triple pendulum in person, and the time spent assembling and disassembling stages of the suspension was invaluable, particularly given my current involvement in the early stages of the design process for a MC Mass Catcher.

The success of the trip was largely thanks to Dr. Calum Torrie, and with whom I worked very closely over the two-week period. I also had the pleasure of working alongside Helena Armandula, Mark Barton, Larry Jones and Janeen Romie on a few of the topics listed below.

The goals set and completed during my trip were as follows:

*(NOTE: Initials in brackets indicate other people involved in each task)*

**Local Control OSEMs**

- Checking and finalising of OSEM design/drawings prior to the December order (CIT)

**Analysis of MC Structure**

- Completion of ANSYS tutorials, CIT an EE (CIT)
- Advancement of the Experimental and FEA analysis on the current MC structure design<sup>1</sup> (CIT)
- Participation in a conference call where the status of the MC Structure analysis was discussed (CAC/LJ/JHR/CIT)

**Blade Eddy Current Damper**

- Testing of the Blade Eddy Current Damper Prototype (as translated form GEO 600), and discussions there-on<sup>2</sup> (CIT)
- Building of an FEA model to assess the internal modes of the MC upper blade<sup>3</sup> (CIT)

**Catcher Product Design Specification**

- Discussions on the status of the PDS (CIT, JHR, HA)
- Brainstorming session: design of Mass Catcher with respect to current MC Structure design (CIT)
- Conference call to Betsy Bland and Doug Cook to gain more feedback on the PDS (eDrawings utilised to maximise feedback) (CIT, JHR)

The significant amount of time and effort spent learning ANSYS whilst at Caltech, should become clear from the summary documents that shall follow this short report. It was invaluable to do so using real examples, and the ability to discuss these examples directly with other users/designers was also hugely beneficial.

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<sup>1</sup> LIGO-T030278 (M. Barton et al)

<sup>2</sup> LIGO-T040004 (R. Jones, C.I.Torrie)

<sup>3</sup> LIGO-T030273 (R. Jones, C.I.Torrie)