T4CM Design Workshop

Pisa, Italy

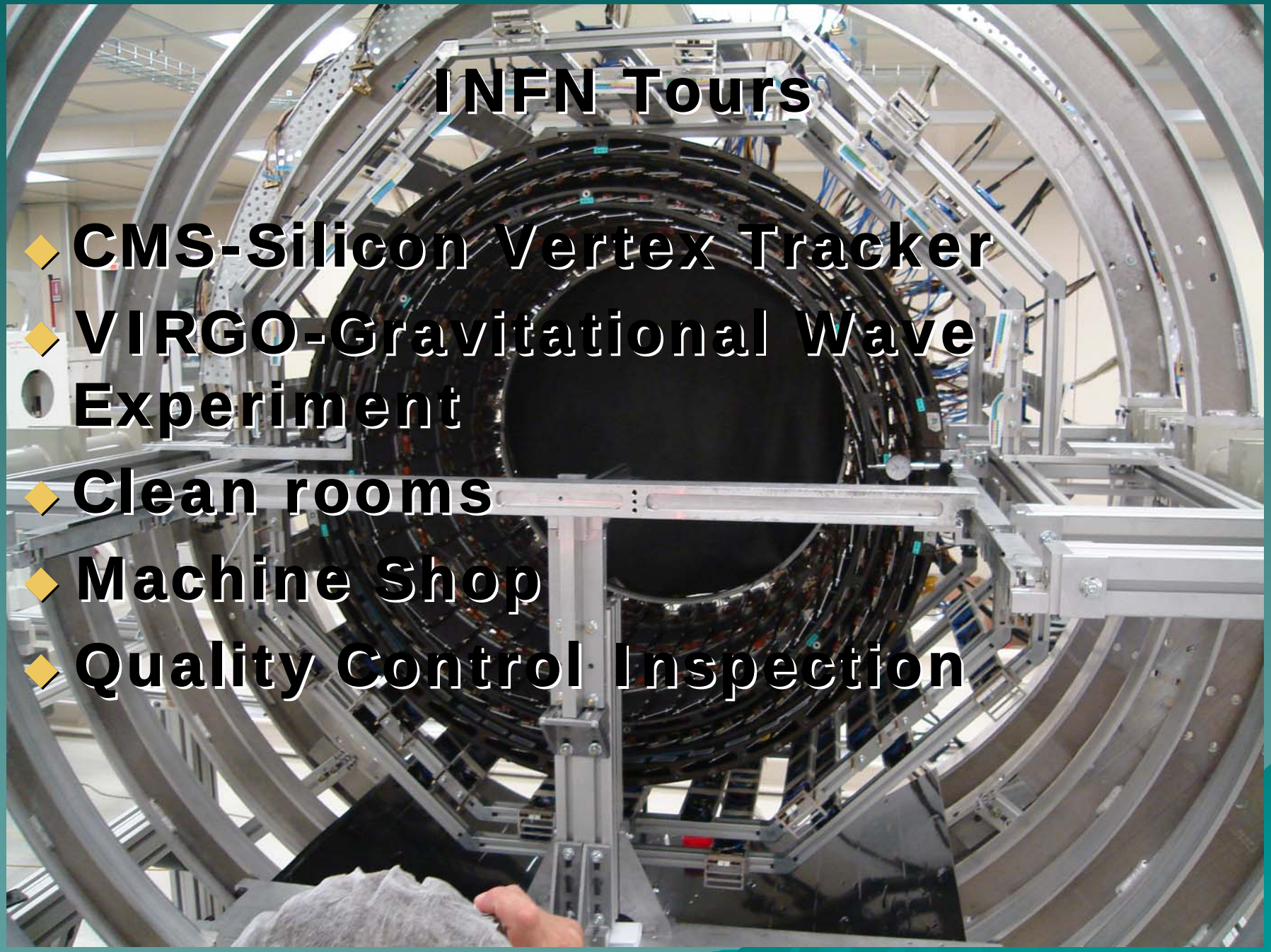
September 4-8, 2006

T4CM Engineering Workshop Agenda

INFN, Pisa

Monday, 4 September, 2006	
10:00 am to 10:45 am	Arrival: INFN, Building C, Room 241
10:45 am to 11:00 am	Welcoming comments, Agenda - Franco Bedeshi (INFN,Pisa)
11:00 am to 11:30 am	Cryomodule design overview – Don Mitchell (FNAL)
11:30 am to 12:00 pm	Cryomodule supports (LHC Indian design)
12:00 pm to 1:30 pm	Pranzo
1:30 pm to 3:30 pm	Cavity / helium vessel / bladetuner design - Paolo Pierini (INFN, Milan) Bladetuner analysis (are the cavity-to-vessel connections strong enough?) Bladetuner material choice (can it be stainless steel?)
3:30 pm to 3:45 pm	Break
3:45 pm to 4:30 pm	Cavity-to-cavity interconnect bellows/flanges
4:30 pm to 6:00 pm	Cavity string design issues • 2-phase pipe, design vs. reality • String extension pipe • HOM absorber • VAT Gate valves
Tuesday, 5 September, 2006	
9:00 am to 10:15 am	Magnetic shielding: • FNAL design (external) • KEK design (internal)

INFN Tours

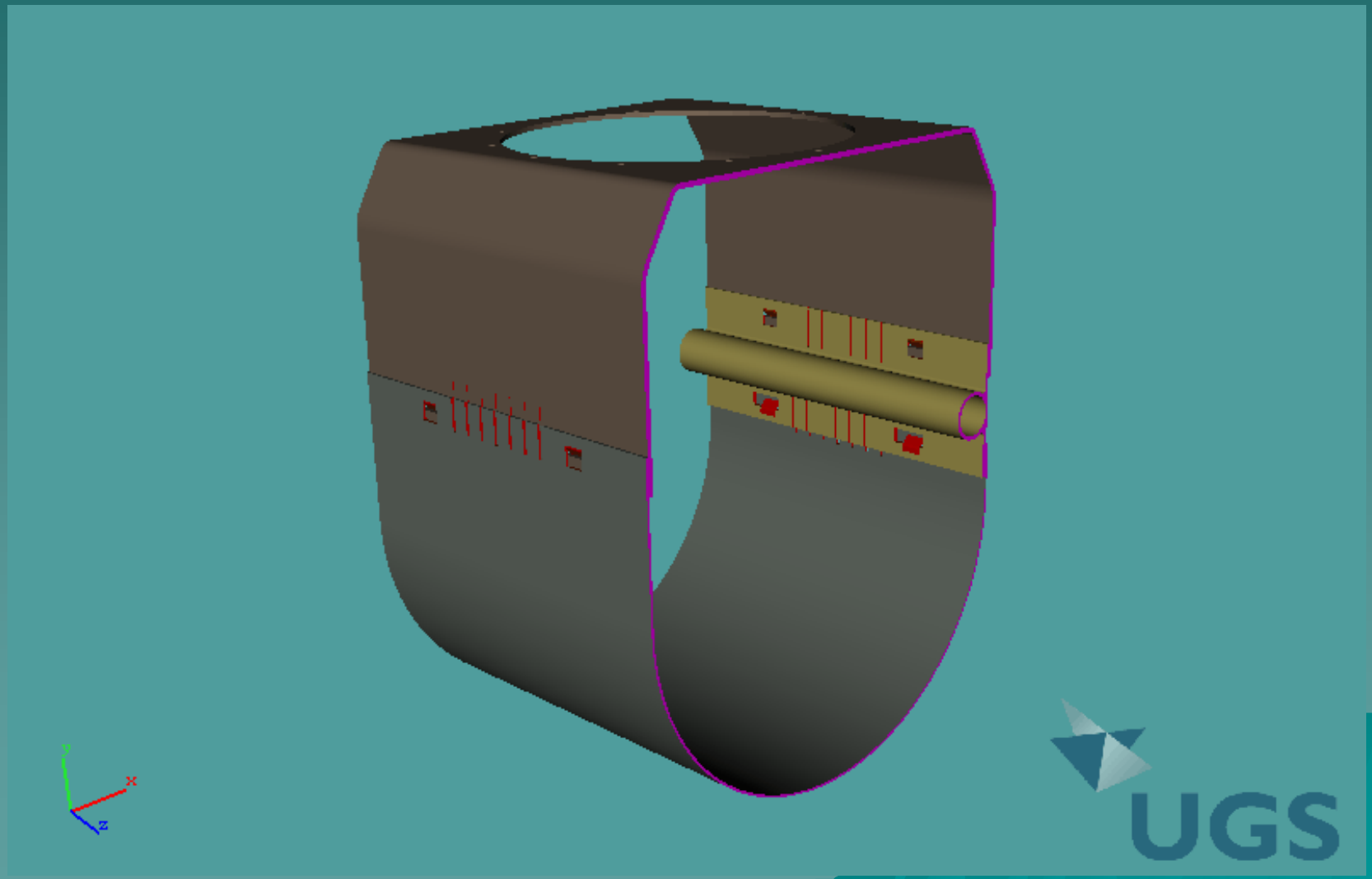


- CMS-Silicon Vertex Tracker
- VIRGO-Gravitational Wave Experiment
- Clean rooms
- Machine Shop
- Quality Control Inspection

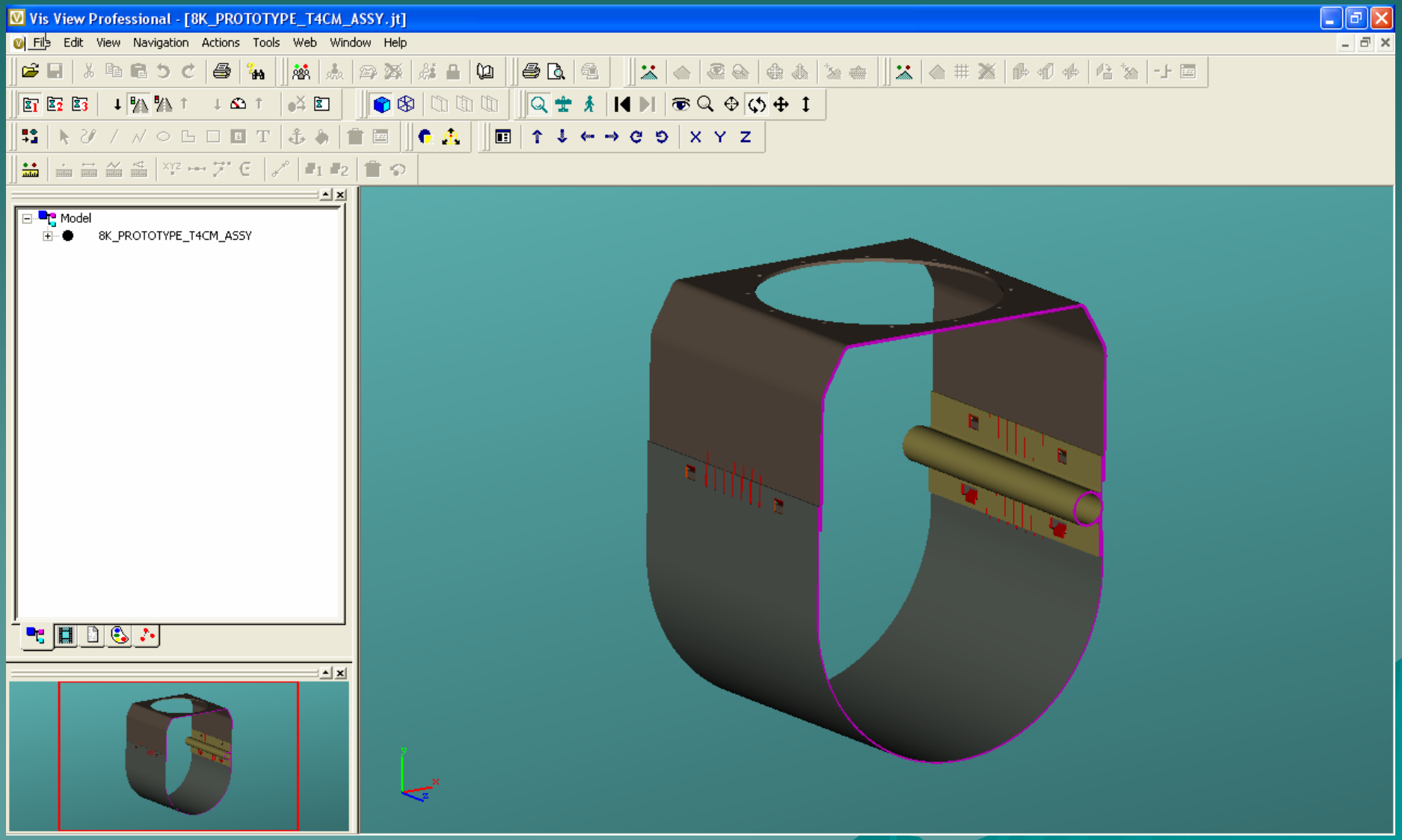
Meeting Format

- Open discussion
- Topic based
- Compared old designs with new proposals
- Some more “formal” presentations
- Assigned tasks
- Learned new collaboration techniques

Sample Topic: Heat Shield Proposed Design Change



VisView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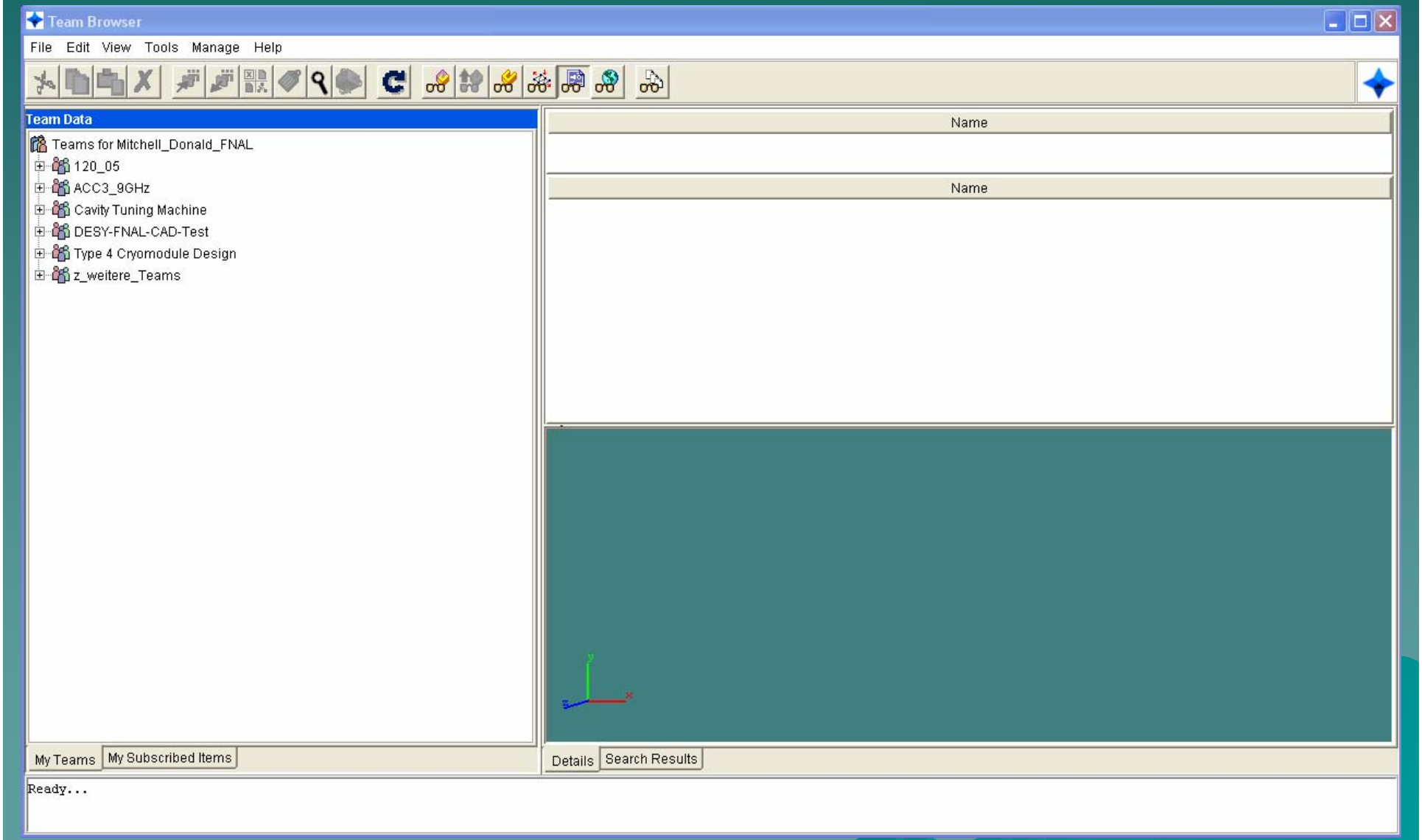
DESY EDMS - Team Browser



Action Items

T4CM Task (Topic)	Action	Assigned to:	Level of difficulty/time
Cryomodule supports (LHC Indian design)	Get India involved in T4CM design at FNAL. Mishra to clarify this plan. Use their LHC vessel support and modify the vessel base to accommodate this support. Two at one end, one at the other. Specs available from FNAL and CERN. Lateral loads at end are a concern. See Peterson for more details. Published papers.	FNAL	easy
Cavity / helium vessel / bladetuner design. Bladetuner analysis (are the cavity-to-vessel connections strong enough?). Bladetuner material choice (can it be stainless steel?)	For T4CM, the helium vessel and transition ring are complete. The bladetuner is being prototyped. Tuner flanges that weld to the helium vessel need a slight re-design so that the magnetic shields can fit under the flanges and yet still leave room for the MLI. Stress calcs are needed. Leave as titanium for the T4CM but investigate if stainless steel can be used for future designs. Can the helium vessel be all stainless steel for the T5CM design for cost reduction?	INFN, Milano	moderate
Cavity-to-cavity interconnect bellows/flanges	A combination of the FNAL design and and more flexible seal will be investigated to reduce the clamping force. A clamp will be used instead of bolts if the seal works. Design and testing for leaks and particles is required.	INFN, Pisa	moderate
2-phase pipe, design vs. reality. Pipe size should be standard size.	Pipe weldment needs to be designed to match the way it is fabricated (mitered welded joint with correct end conditions). The pipe needs to be sized as a standard titanium pipe. Bellows should be modified to match this new size.	INFN, Pisa	easy
String extension pipe.	How can the string extension pipe be shortened or removed? Can the HOM absorber be put into this space.	FNAL	moderate
HOM absorber. VAT Gate valves.	Look at HOM absorber design requirements for beam dynamics. Design the HOM to fit in the "dead" space at the end of the cavity string and before the gate valve.	FNAL	moderate

Future Plans

- November EDMS training at FNAL
- January 2007 T4CM Collaboration meeting in Milan, Italy