

Cryomodule Design Status

3rd Harmonic

Type III+

T4CM

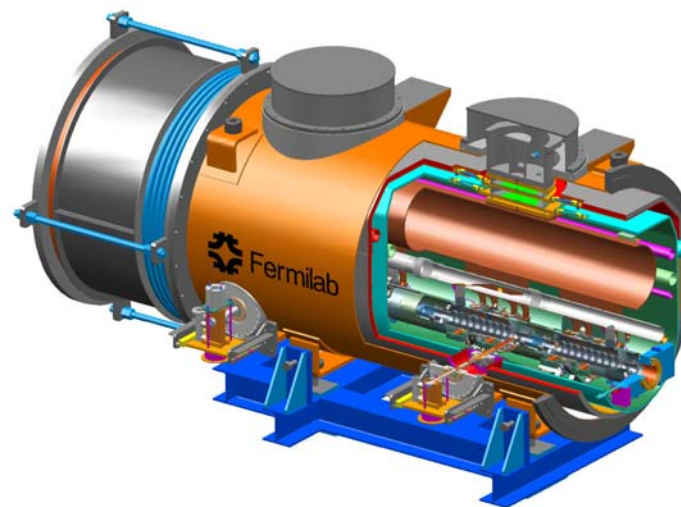
Type V (ILC)

3.9 GHz, 3rd Harmonic

The design of the cryomodule has been completed. Components for the cryovessel, helium vessels, bladetuners, heat and magnetic shields, and cold mass supports have been ordered with delivery beginning in the summer of 2006. We are currently following up on the bid process for many of these main components and implementing some small design modifications as needed. DESY engineers will be designing and procuring the RF and vacuum systems.

Assembly tooling for the cavity string and the cold mass is well underway. Many of the fixtures are common to the 1.3 GHz cryomodule which are currently being assembled and installed at Fermilab. Others, like cavity support posts, will be slightly modified for the 3.9 GHz cavities.

The cavity string will be assembled at Fermilab but the cryomodule will be pre-assembled to check the fit of all components, disassembled, and then shipped to DESY for final assembly. Ultimately, the cryomodule will be installed in DESY's TTF in 2007.



Type III+

- Kit delivery from DESY: Fall 2006.
- Recently completed 7 weeks of cavity string and cryomodule assembly documentation at DESY (Cryomodule #6).
- Documented missing parts and tooling details while at DESY.
- Held a 5 hour training session on cryomodule assembly steps with designers and lead technicians.

T4CM (Modified TTF style)

- Completed the 3-D and 2-D *preliminary* CAD package used for cost estimation by FNAL and US Industrial Forum. This package will be used as the base design for the T4CM design collaboration.
- Established a “team” environment in DESY’s EDMS to be used as the central CAD work location for the collaboration. All CAD data will be located at DESY.
- Created 12 EDMS user accounts and provided training to D&D staff.
- We have just begun to design within this EDMS system. All components will be modeled and detailed with “best practices” and will conform to ASME drafting standards, will be detailed in metric, and will use tolerances in accordance with ISO standards.

T4CM (continued)

- 5 contract D&D personnel, 1 lead designer, and 2 engineers will work for ~4 months on this T4CM design package. This *short* cryomodule will not have a magnet.
- The quad package is being designed and engineered by Vladimir Kashikhin (TD). There is currently NO design that can be placed in the T4CM cryomodule.
- Once a Quad package is ready, we will begin to design the *long* cryomodule.
- The T4CM has a Type III (TTF style) cryo piping layout.
- The layout at New Muon will consist of Type III and Type IV vessels. These vessels do NOT have an ILC cross-section. Cryo piping is too small.

Type V (ILC style)

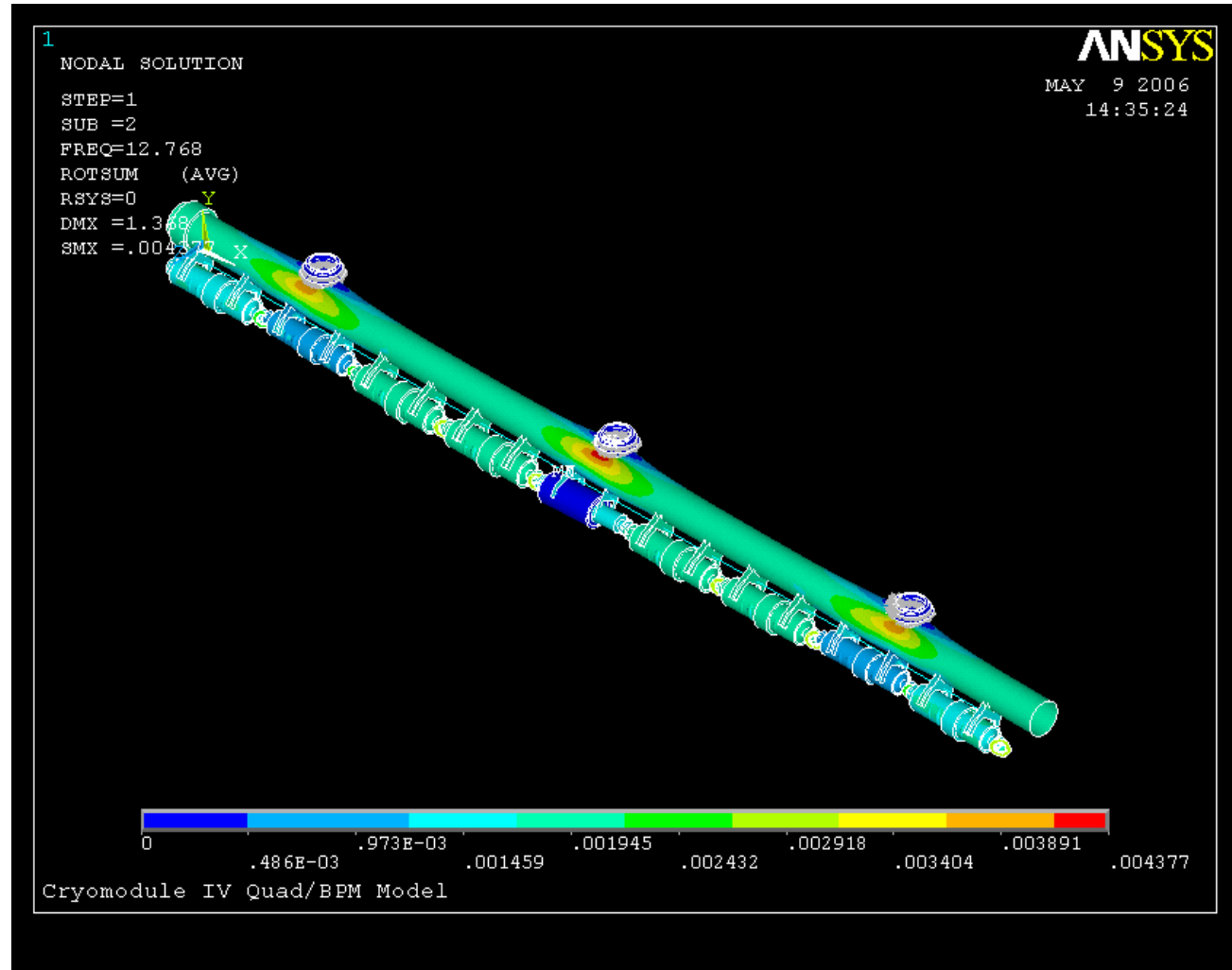
- To my knowledge, no design or engineering effort is in progress with this cryomodule.
- Cryo piping needs to be resized.
- Magnet package, either in or out, needs to be decided.
- Won't match the cross-section at New Muon. Transition vessel will be needed.

Vibration Analysis

- Mike McGee will now discuss his work on cryomodule vibration analysis.
- We should add Mike to our list of talks so that his work is separated from the general cryomodule design work.

Initial ANSYS Analysis

Mode Shape 1
(12.7 Hz)
Transverse Hinging



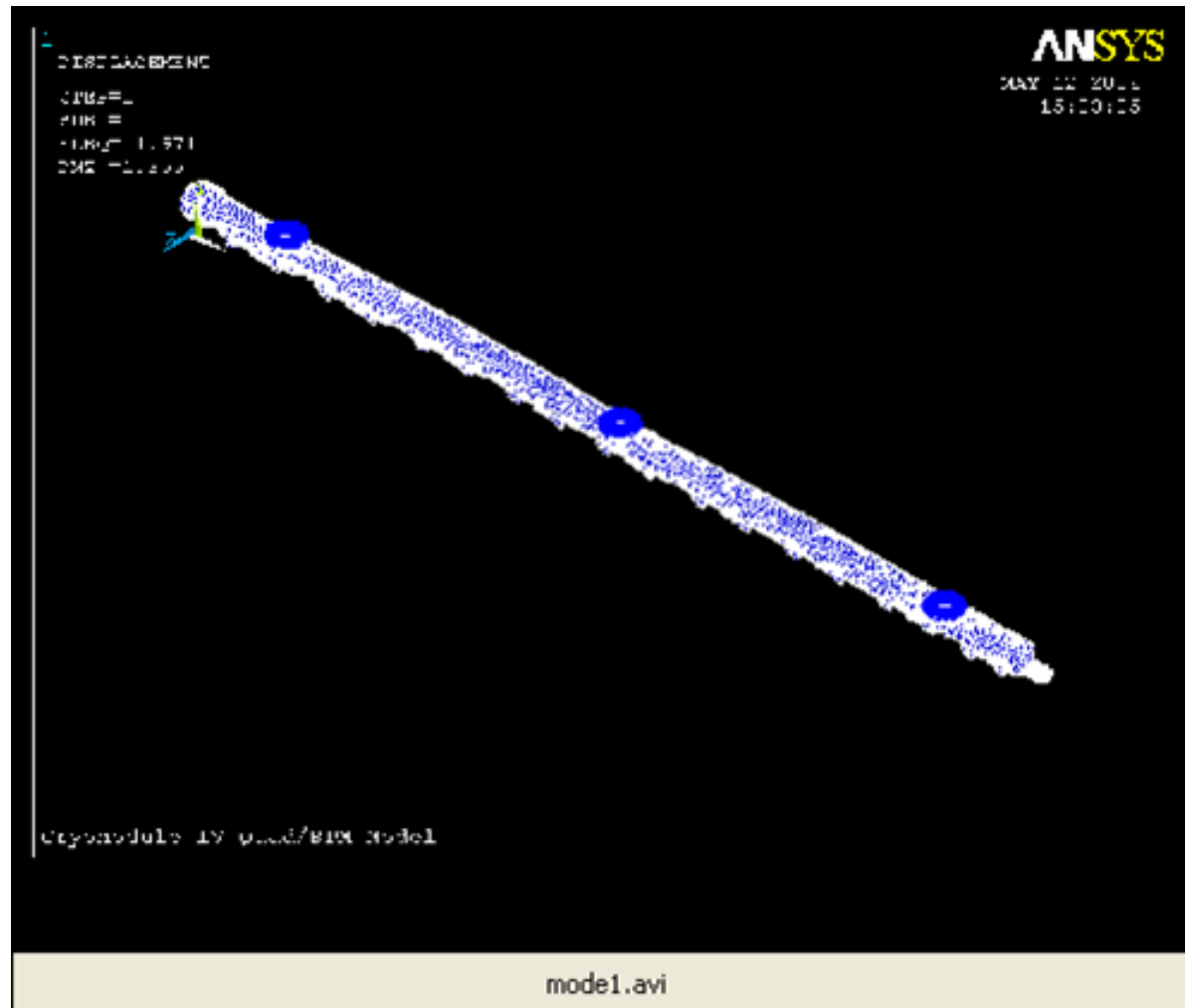
on

Current Work

- Benchmark
 - TTF Cryomodule Modeling (and validation using INFN & DESY data)
 - Capture Cavity 2 Analysis and cold mass measurements at Meson

TTF CMS (Mode Shape 1)

Mode Shape 1
(11.4 Hz)
Transverse Hinging



Future Work

- Begin Harmonic (forcing function) simulations
- Begin Sensitivity Studies
- Vibration work is an on-going process to validate and understand the stability of future cryomodule design