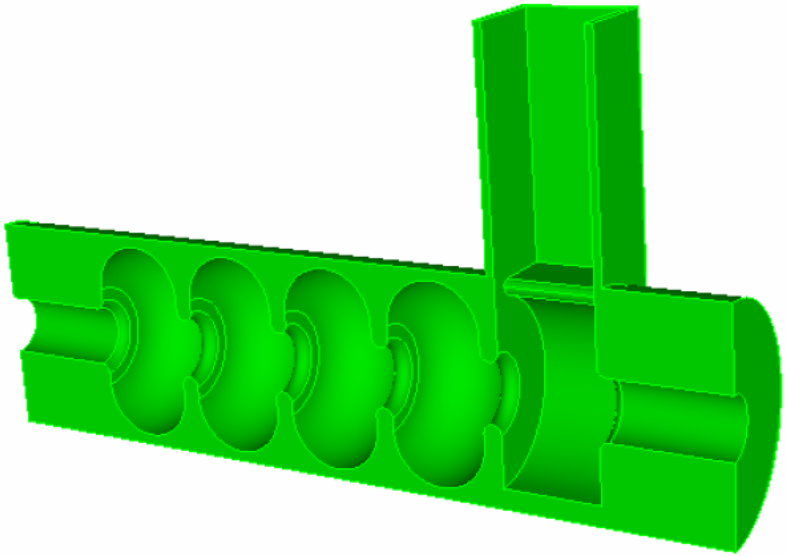
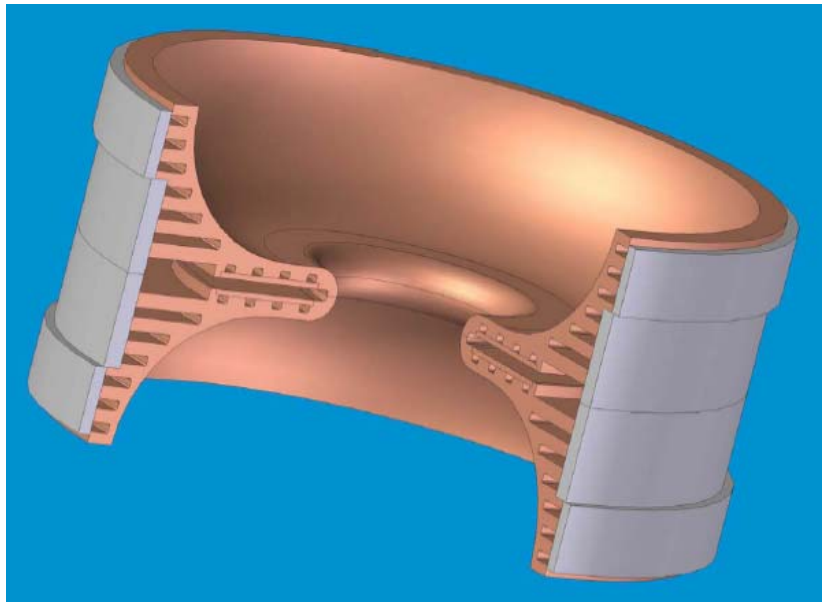
NC Structure for ILC Positron Capture Accelerator

- Goal – Design accelerator for positron capture region:
  - 60 mm aperture, 15 MV/m gradient, 1 msec pulses, 0.5+ T field.
  - Average heating of 5 kW/cell from rf losses and 7.5 kW per cell from particle losses.
- Approach – Adopt pi-mode SW design with extensive cooling (vs DESY CDS pi/2 mode design originally developed for proton linacs).
- Plan – Build 5 cell cavity and test at NLCTA in FY06 with 5 MW source (actual design would be 11 cells). Operate in magnetic field but have not thought of way to simulate particle heating.
- Status
  - Basic rf design complete
  - Optimizing cooling
  - Working to finalize coupler, window and flange designs
- Personnel: Design efforts coordinated/reported at Structures Group Meeting (Thursday's at 3:00 in Gold Room) – presentations posted at http://www.slac.stanford.edu/grp/ara/structures_meeting/index_2005.html



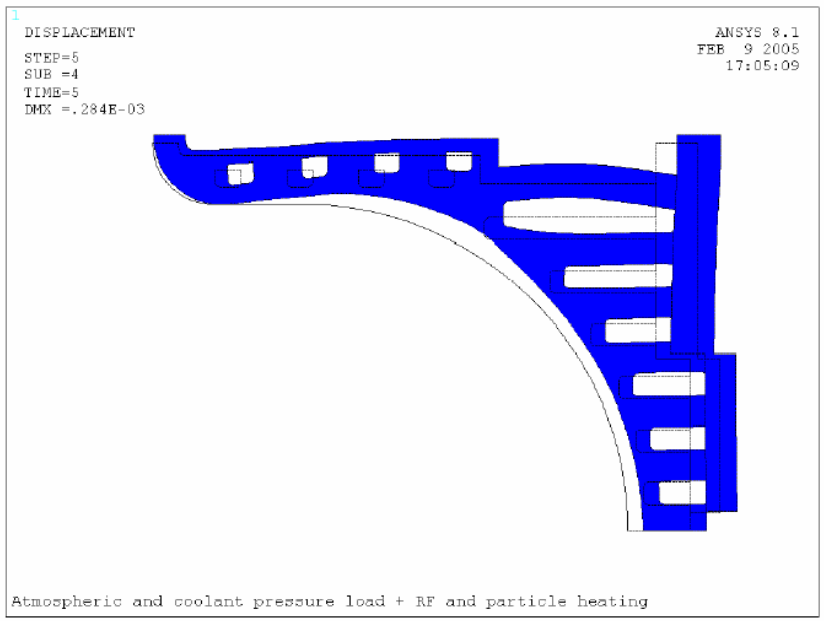


Pulse Temperature Rise < 20 deg C

Average Detuning = 69 kHz

Pulse Detuning = 17 kHz

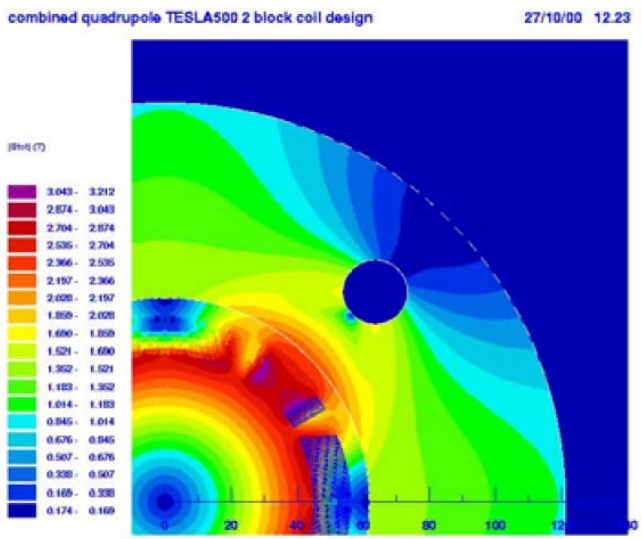
Detuning that produces ~20% reflected power = 21 kHz



ILC Linac SC Quad/BPM Evaluation

- Goal – Demonstrate Linac Quad/BPM performance required for ILC
  - Verify ~ 5 micron stability of quad magnetic center
  - Show ~ 1 micron BPM resolution and < ~ 5 micron quad-to-bpm stability in compact, 80 mm aperture design.
- Approach – Test TESLA prototype quad built by CIEMAT in Spain and BPM developed at SLAC.
- Plan – Build cryostat for prototype quad and test at Magnetic Measurements Lab with rotating coil. Do beam tests of BPM and eventually integrate quad and BPM for test in LI02.
- Status
  - Beginning cryostat engineering – expect first magnet test in 2/06.
  - Working with Zenghai on BPM design.
- Personnel: Cryostat efforts coordinated by EFD cryo group (John Weisend). Meet every other week on Thursday at 10:00 in Fuji. See http://www-user.slac.stanford.edu/star/images/ILC%20SC%20Quad%20Notes.pdf

Quad at CIEMAT
(~ 0.7 m long)



Possible BPM Design