CM2 Tuner Testing in HTS

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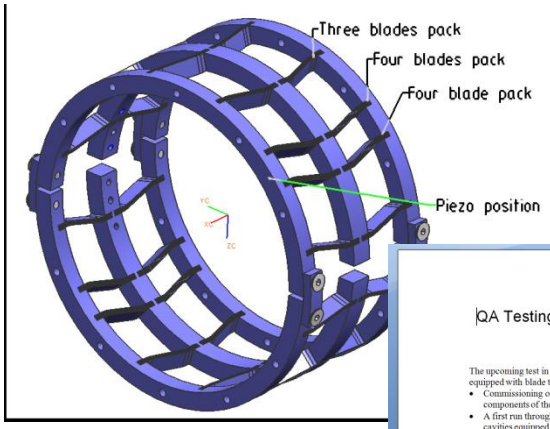
QA Testing of CM2 Tuners

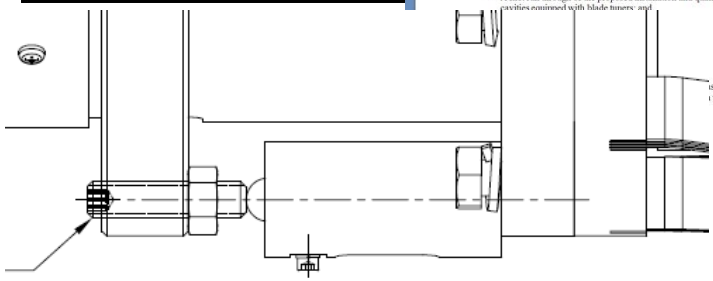
- CM2 cavities will be equipped with a coaxial blade tuner to limit Lorentz Force Detuning at high gradients
  - Tuner developed by INFN/Milan
  - Piezo mounts modified by FNAL

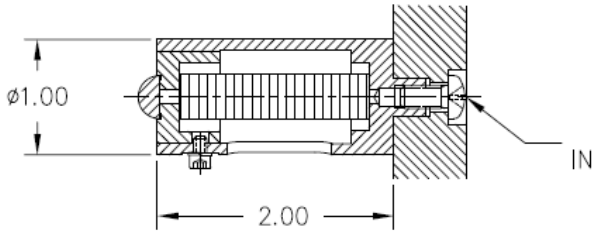


QA Testing of the Blade Tuner Installed on the AES-004 SCRF Cavity

The upcoming test in the Fermilab Horizontal Test Stand (HTS) of the first SCRF cavity equipped with blade tuner, AES-004, will serve three important purposes:

- Commissioning of the hardware and software required to test the fast and slow tuner components of the SCRF cavities to be installed in CM2;
- A first run through of the proposed installation and quality assurance procedures for cavities equipped with blade tuners; and





Cavities Tested

- Total of 3 CM2 cavities tested to date
- All used same piezos and piezo holders

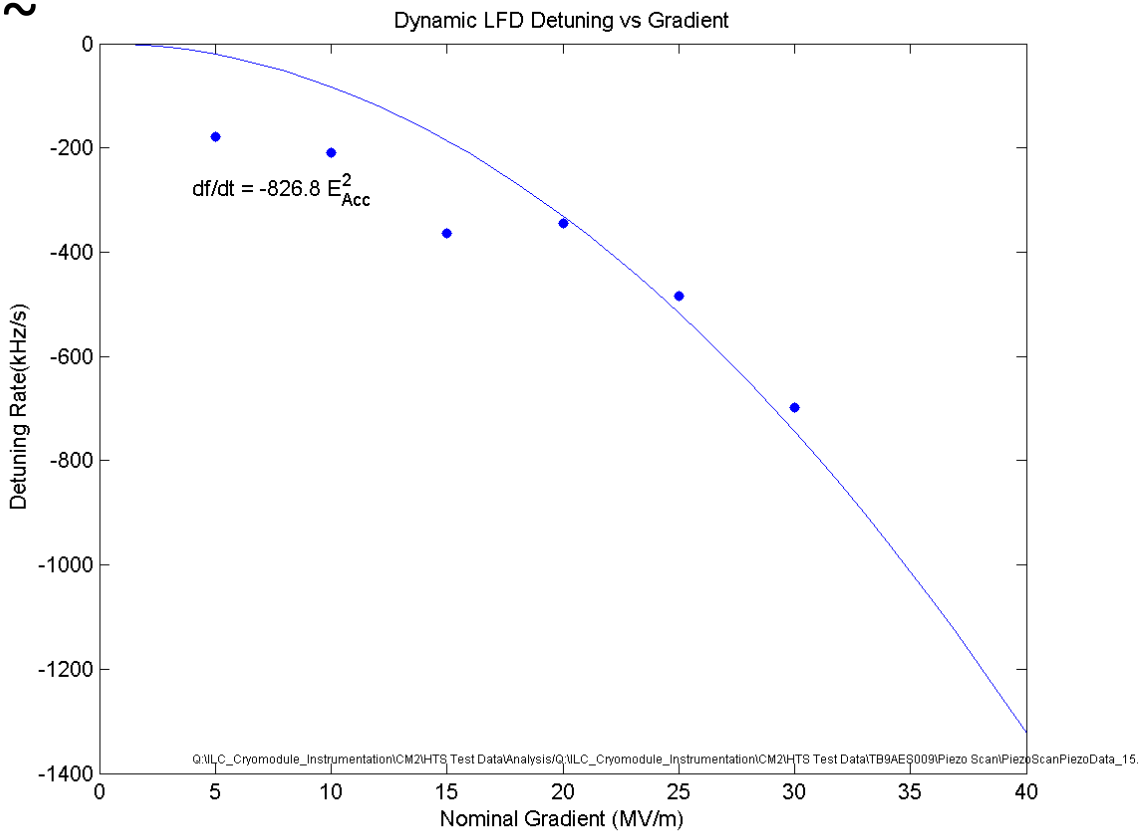
Cavity	Tuner	Tested	Comments
ACC013	Tuner 01	February	Piezos unseated
AES009	Tuner 11	April	Loctite
ACC008	Tuner 11	May	
ACC013	Tuner 01	June?	Not tested yet
AES010	Tuner 03	August?	Planned

ACC013 (February)

- Successfully controlled LFD at gradients of up to 35 MV/m
- When the cavity was removed from the HTS piezo holders were not seated properly
  - Holder retaining screws had not been installed because of time constraints

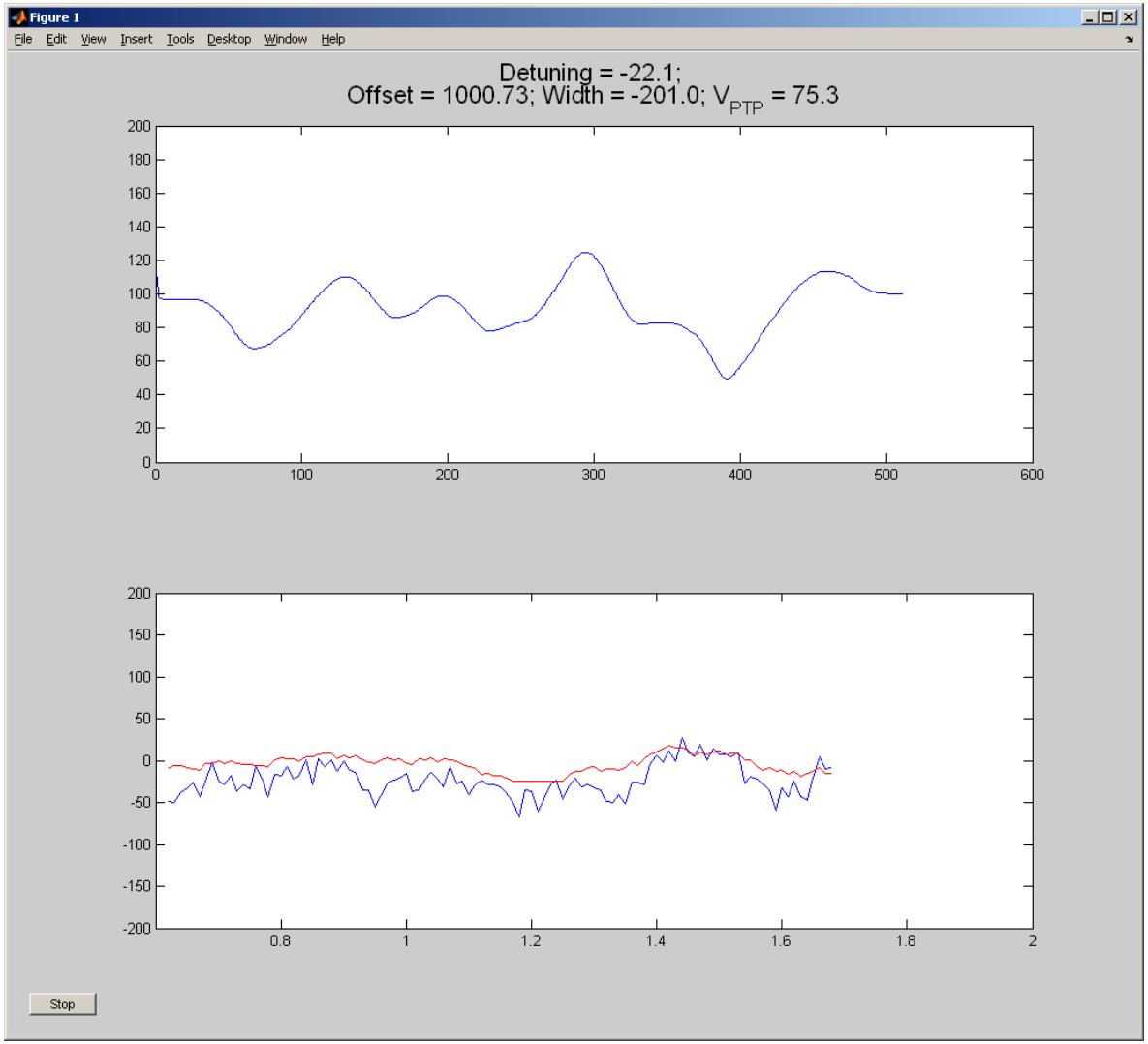
AES009 (April)

- Sensitivity to piezo expected (~ 3Hz/V vs ~ 8 Hz/V)
- Only able to compensate LFD at gradients below ~25 MV/m.
- Post-mortem
  - Loctite applied to retaining screws had seeped between the base of the piezo holder and the tuner ring



ACC008 (May)

- Successfully controlled LFD up to 27 MV/m
- Piezo sensitivity as expected
  - Retaining screws installed without Loctite



Current Status

- Three CM2 cavities tested thus far with mixed results
  - Problems with retaining screws and Loctite may be resolved
- Testing and analysis of data from individual tests now relatively routine
- Still need to systematically compare tests to each other and to Milan design goals