

Laboratory Report

INFN Milano - LASA

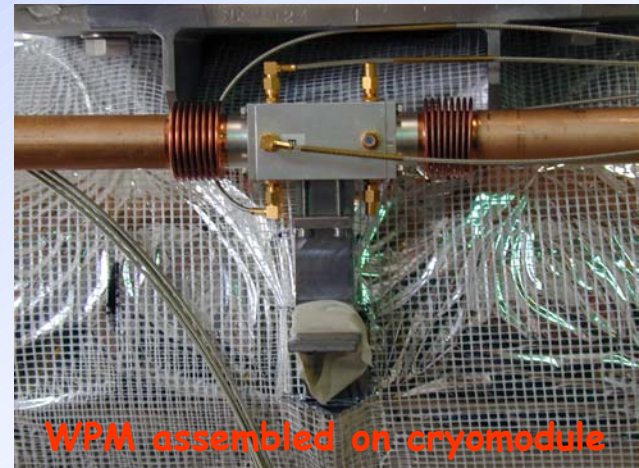
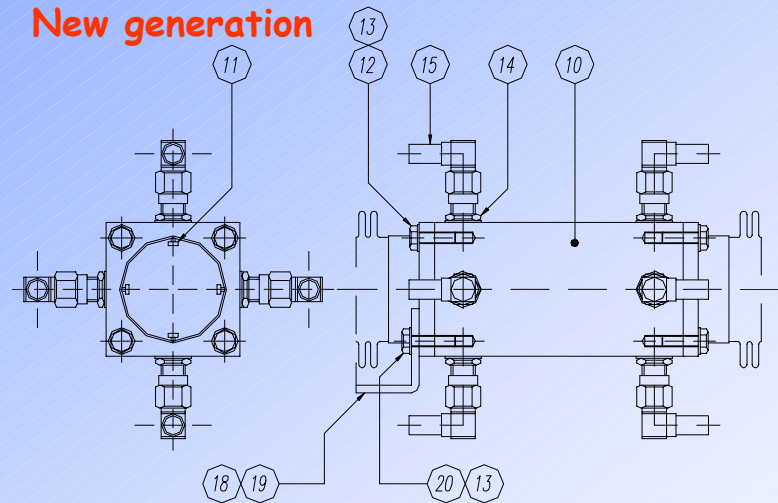
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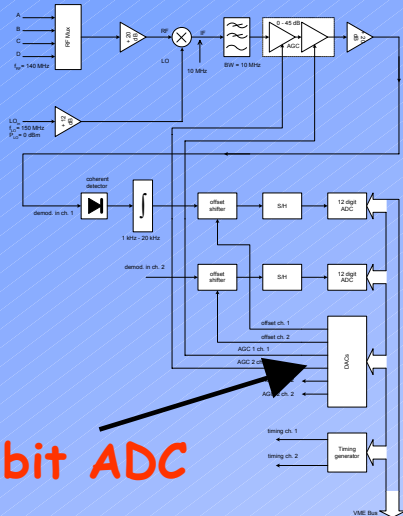
Activities Underway

- **Piezo Vibration Control:** microphonic control and simulation tools
- **Wire Position Monitor:** new generation WPMs mounted on cryomodule and readout connected to control system
- **Cathodes:** production system repaired, new cathode mask installed. Optical characterization of Cs_2Te photocathodes and first spectra with 5th harmonic ($\lambda = 211 \text{ nm}$)

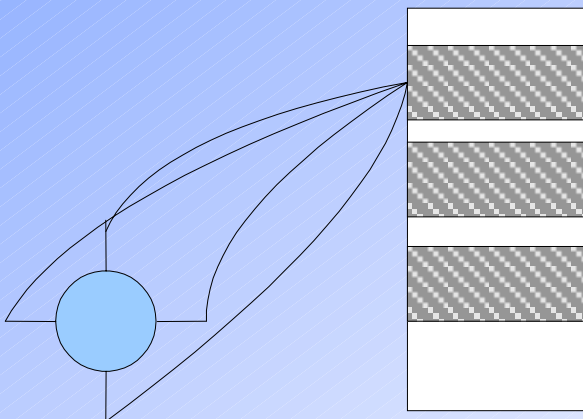
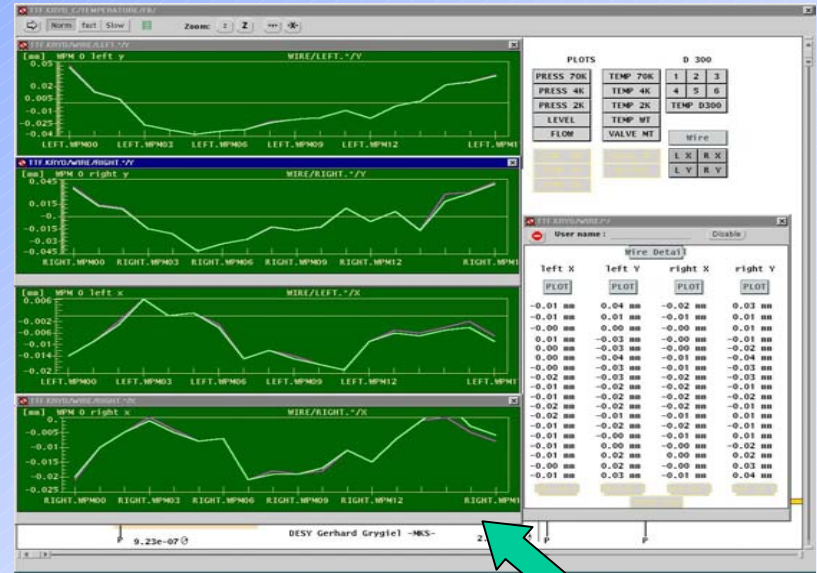
Wire Position Monitor 1/2



Wire Position Monitor 2/2

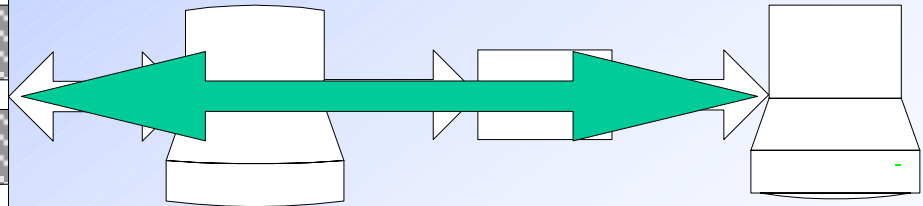


12 bit ADC



WPM Chain

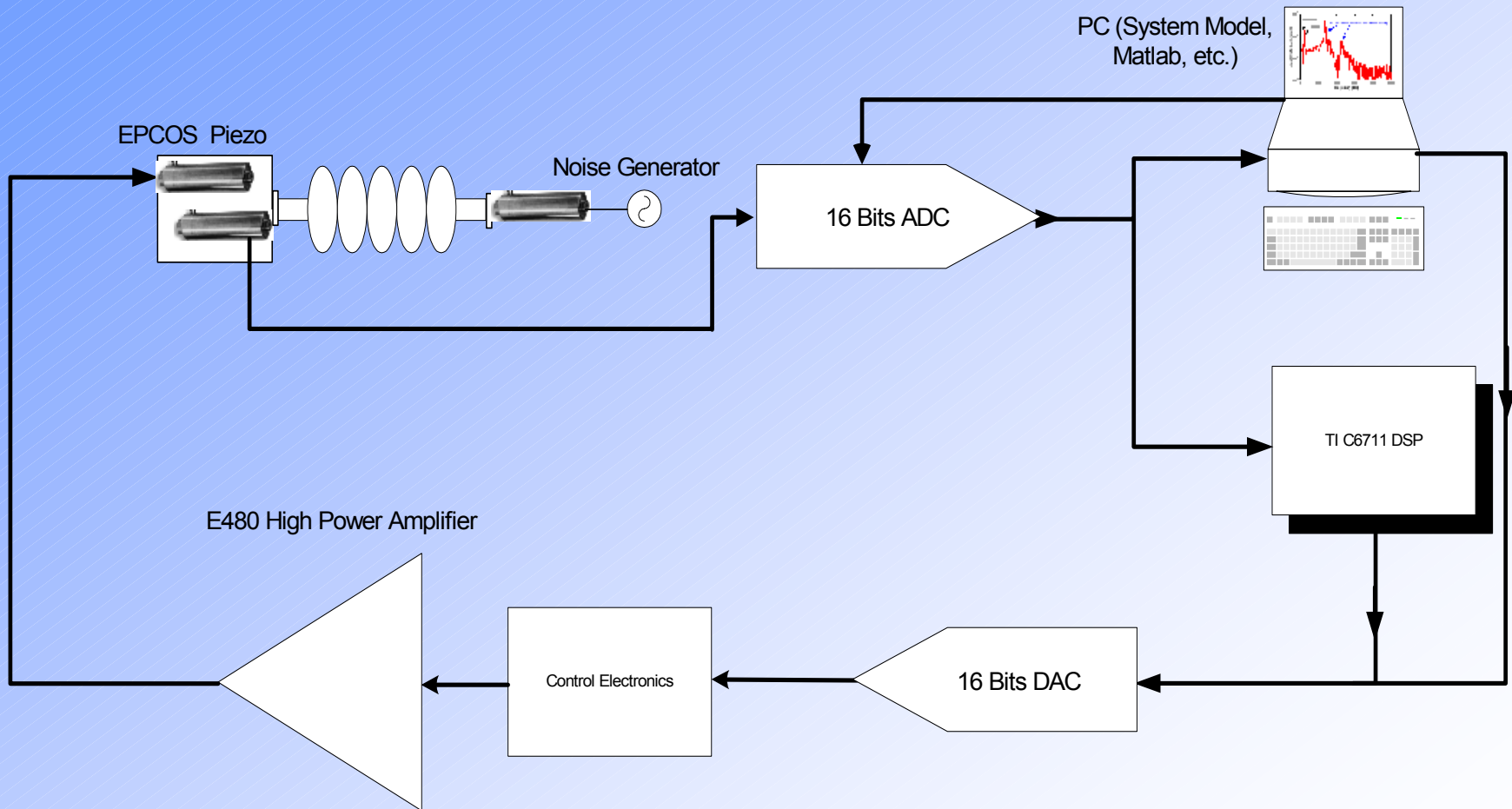
Control Electronics



Windows Based PC
With LabVIEW
Program

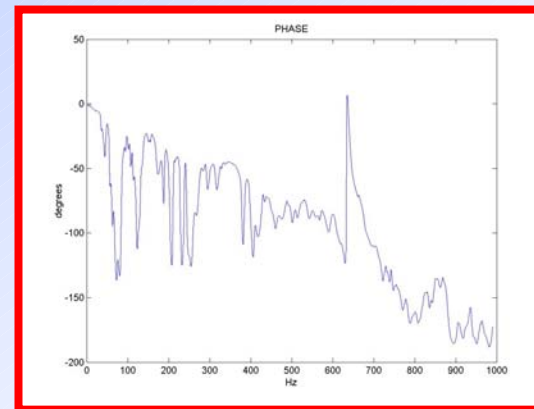
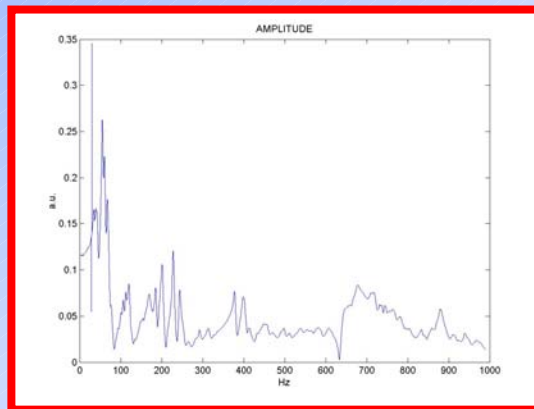
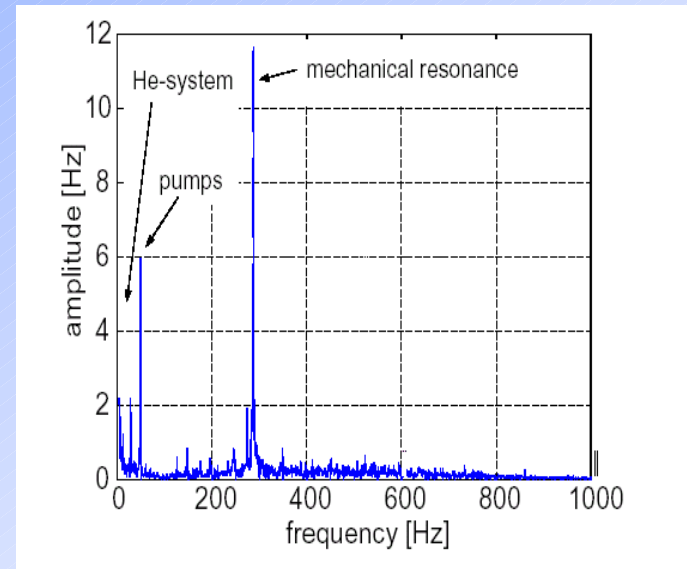
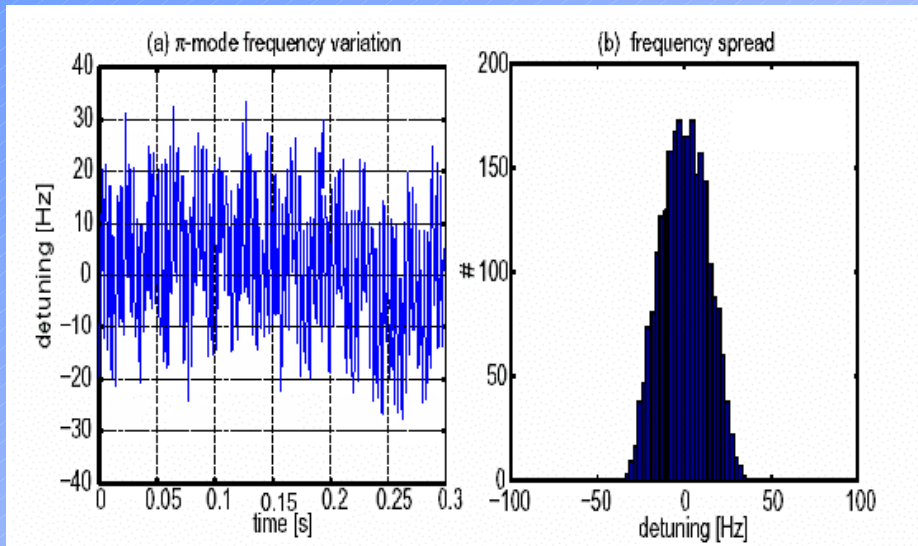
TTF Console

Piezo Vibration Control



Piezo Vibration Control

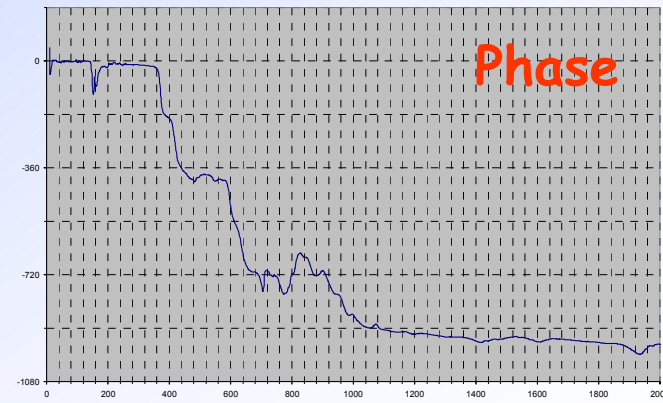
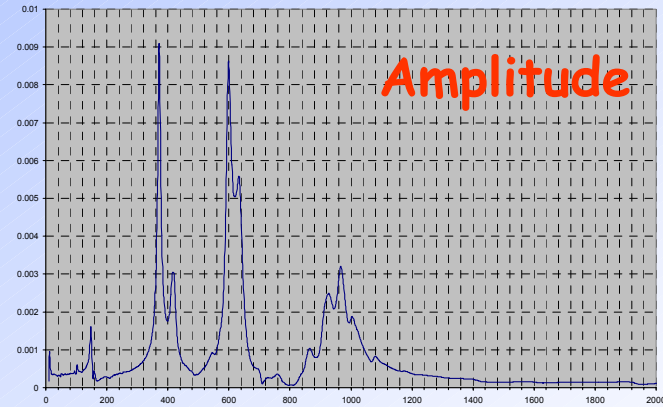
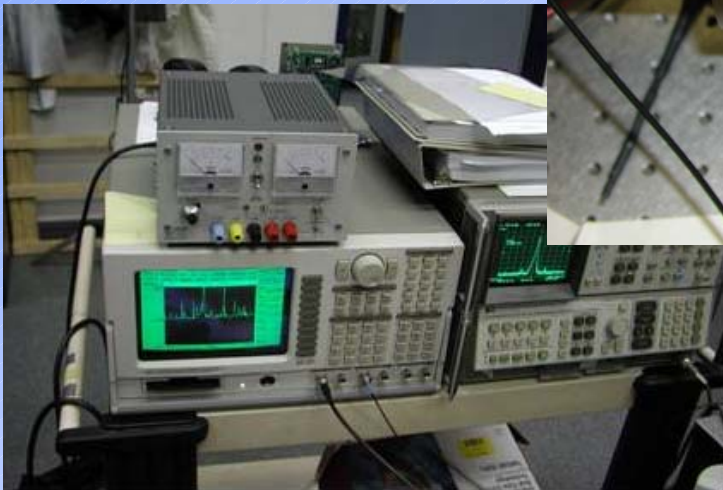
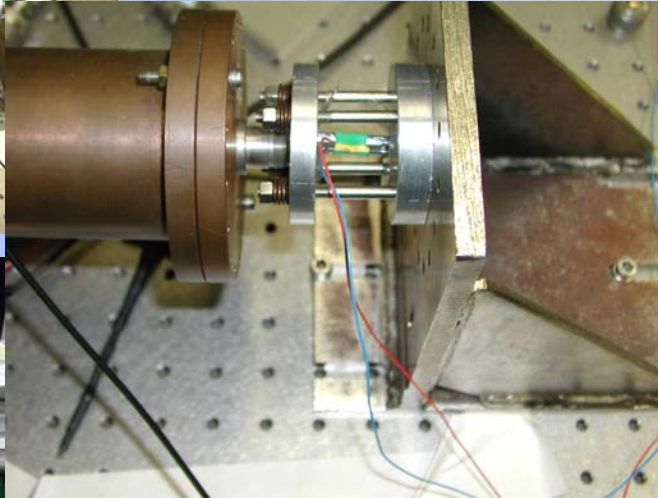
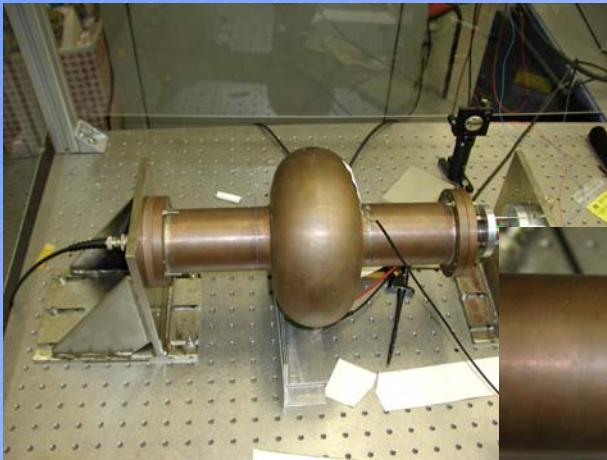
Measurements in collaboration with DESY



Piezo Vibration Control

Measurements @ LASA

Transfer function
 $U_{\text{piezo}} / \Delta\phi$



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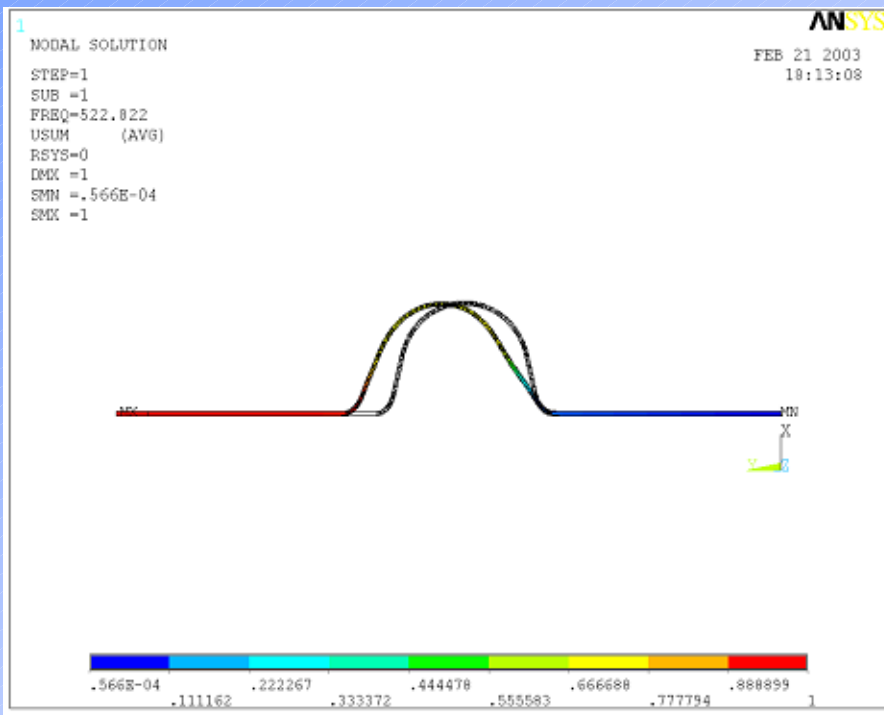
TESLA Collaboration Meeting
INFN - Laboratori Nazionali di Frascati
26-28 March 2003

Piezo Vibration Control

Simulation @ LASA

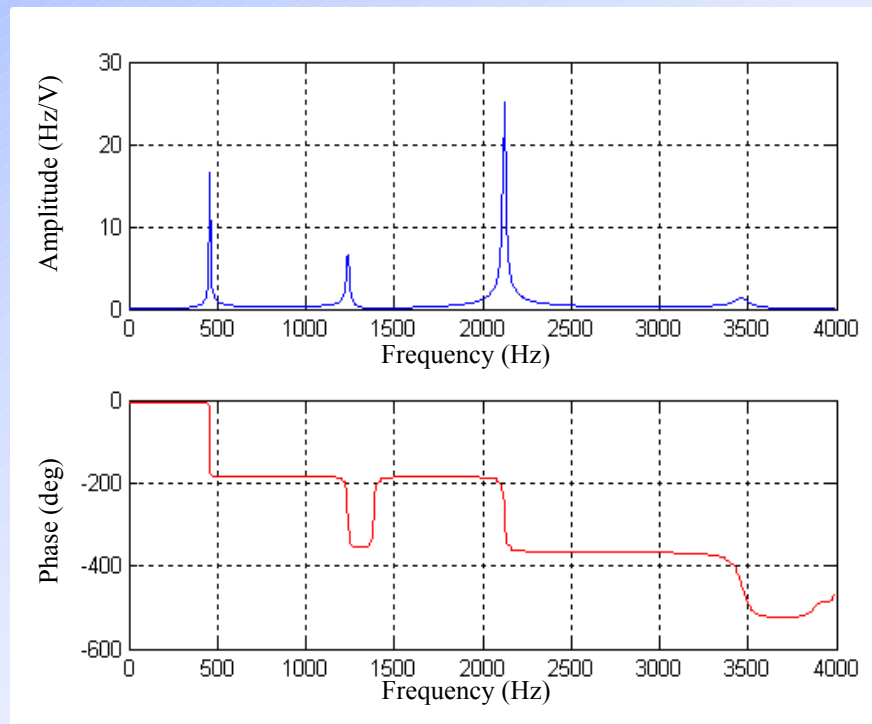
- Superfish
- Ansys
- Ideas
- Matlab

Simulation of the cavity first vibrational mode



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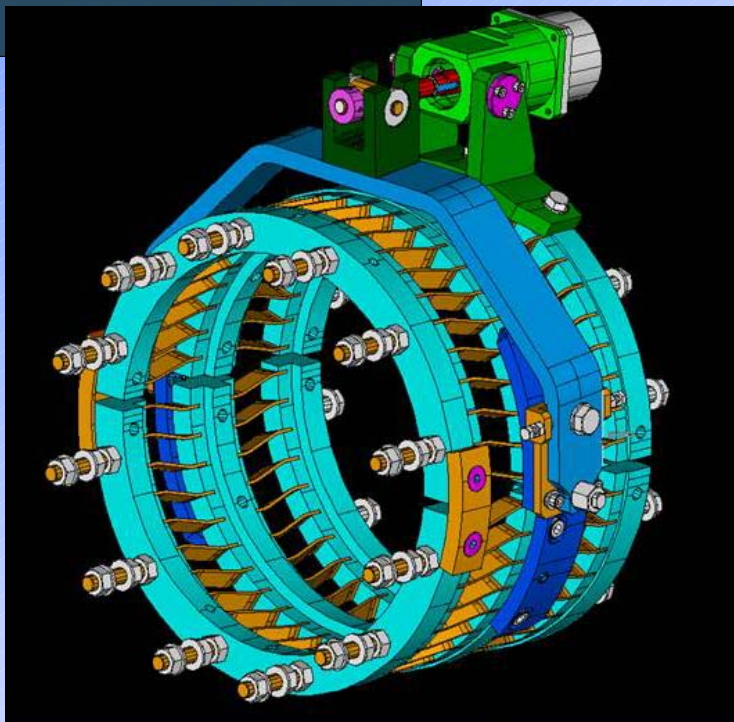
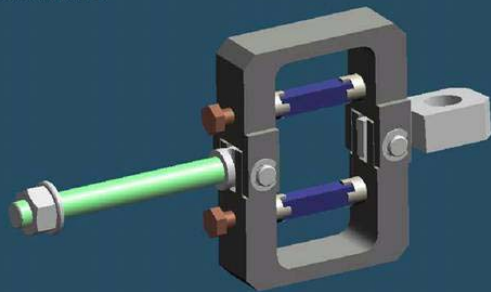
Simulation of the transfer function
piezo voltage / Δf



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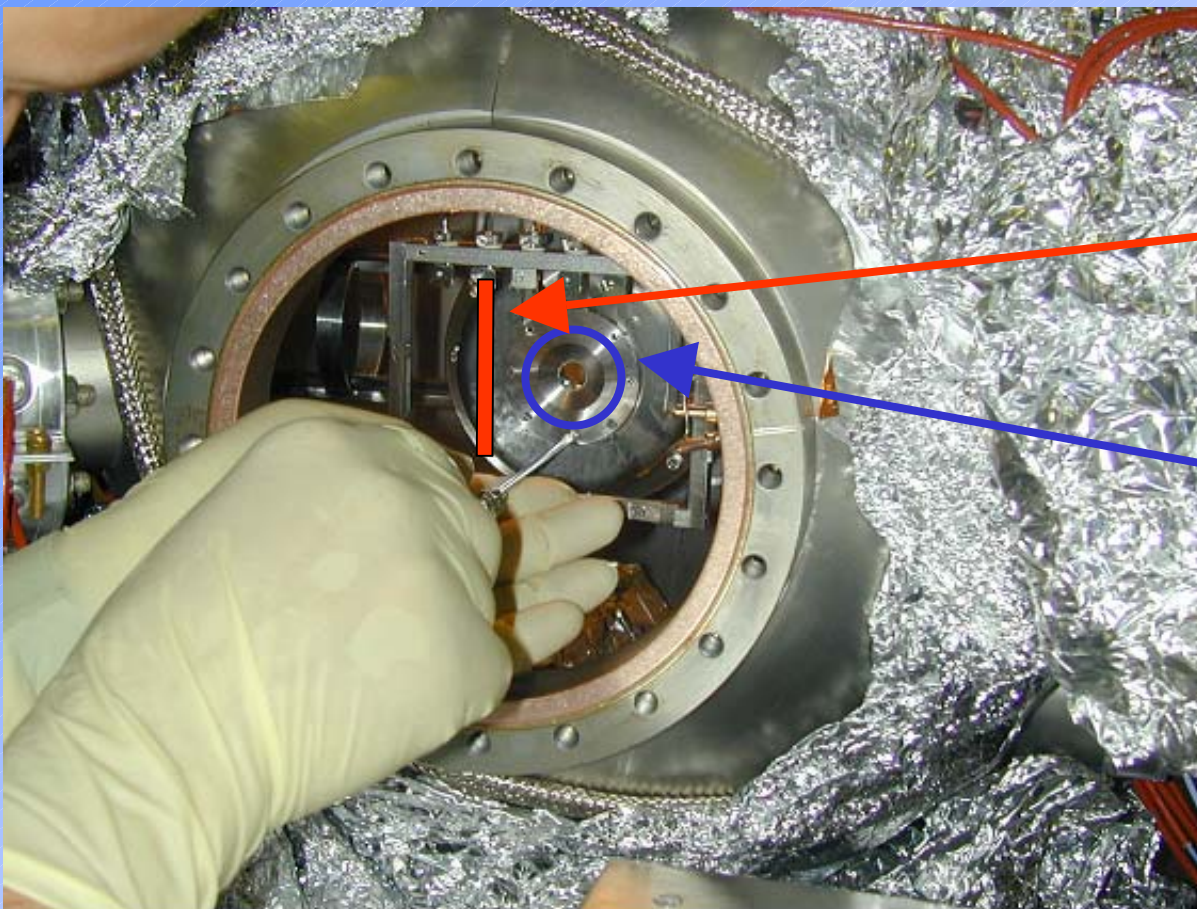
Piezo Integration in Tuner

Piezo fixture



- Need to implement Piezos actuator.
- Natural position is in the link between Tuner and Helium Tank
- Just one actuator (and one sensor) pushing out-of-axis and two elastic bending joints to complete the symmetry geometry
- Design under development for TESLA-XFEL (prototype HAS to be ready for this summer)

Cathode Preparation System

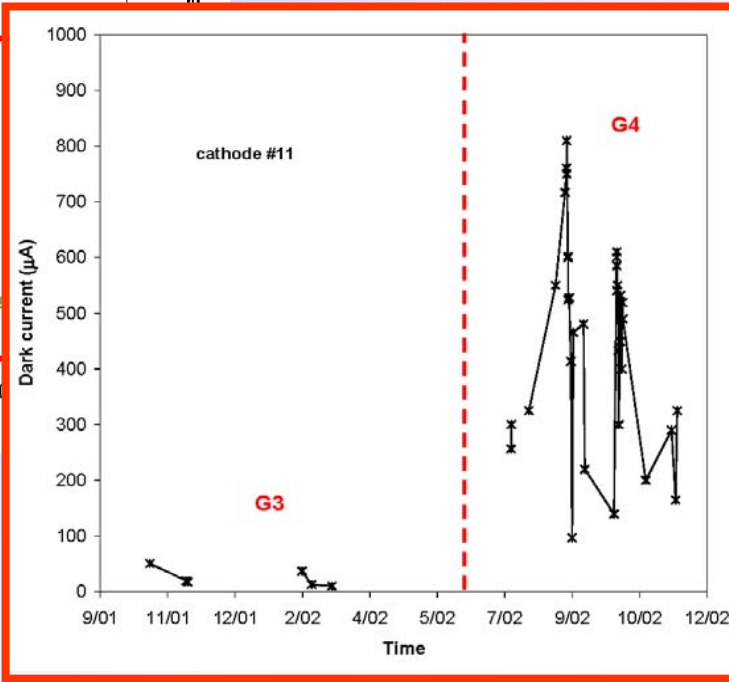
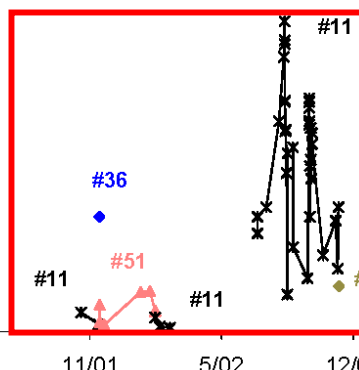
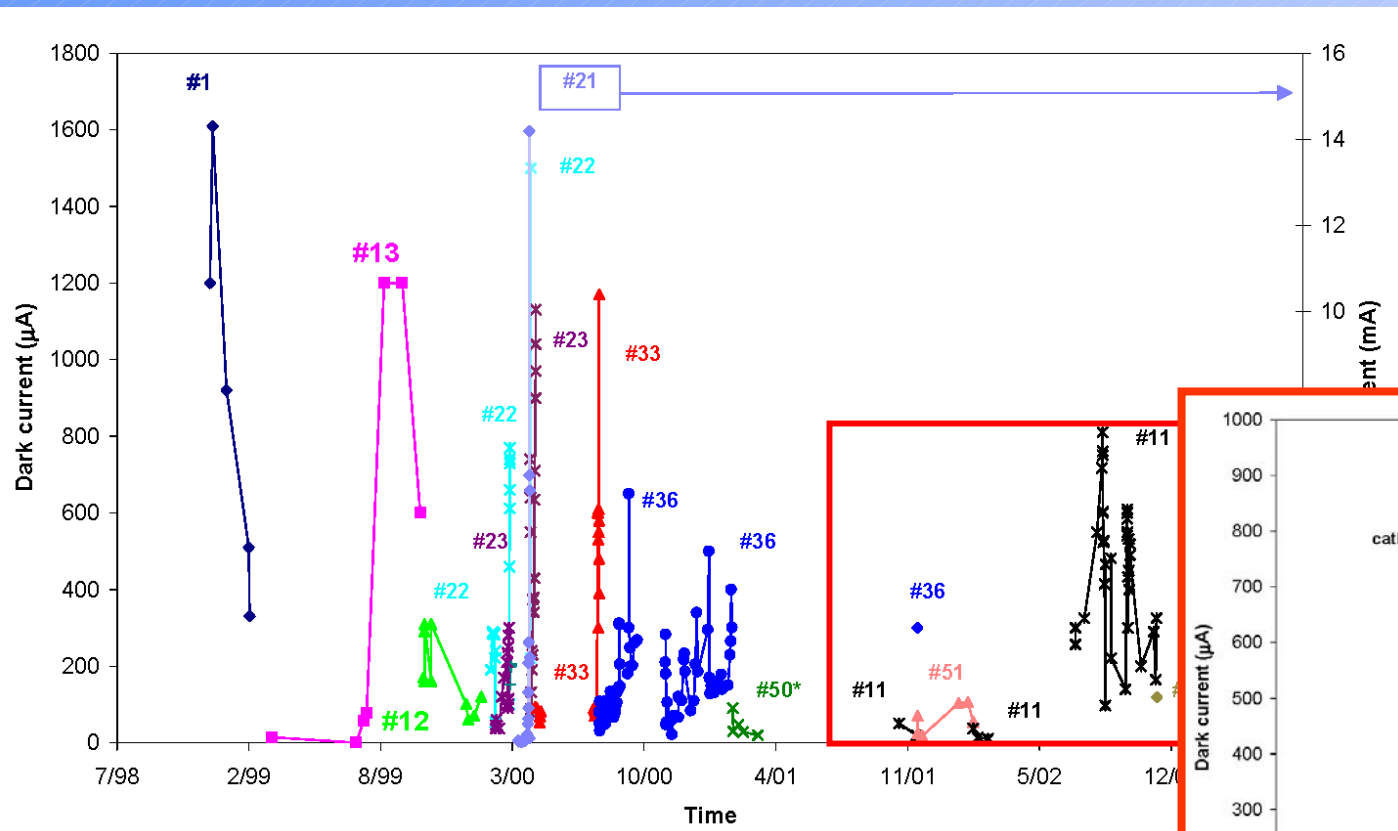


- Sources replaced. New Te, Cs and K sources.

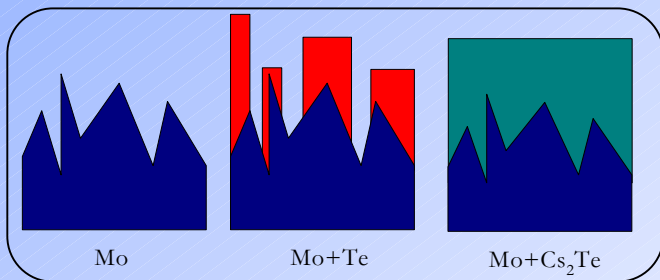
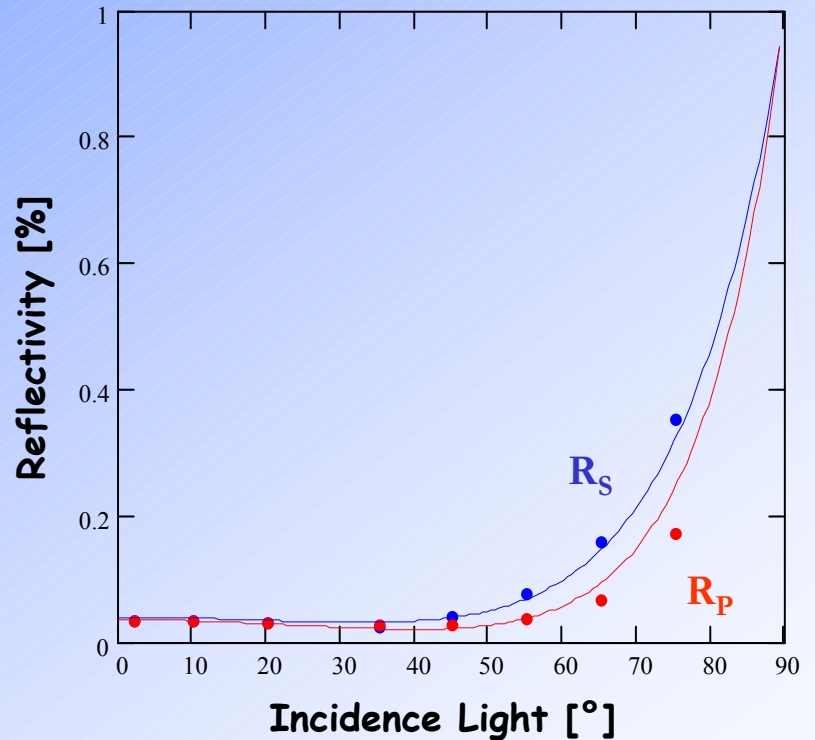
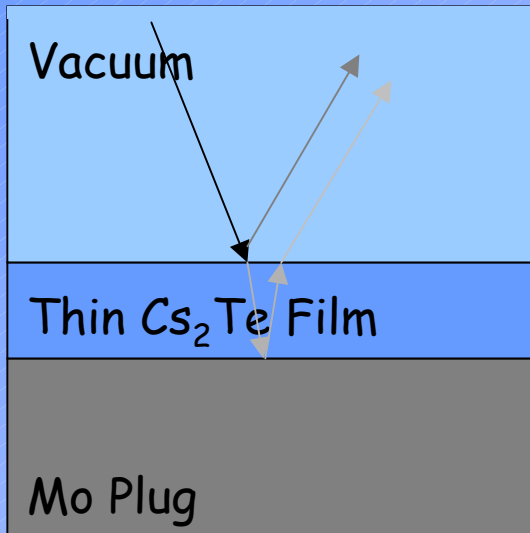
- Masking changed to 5 mm diameter

- Valve repaired

Cs₂Te Dark Current @ DESY

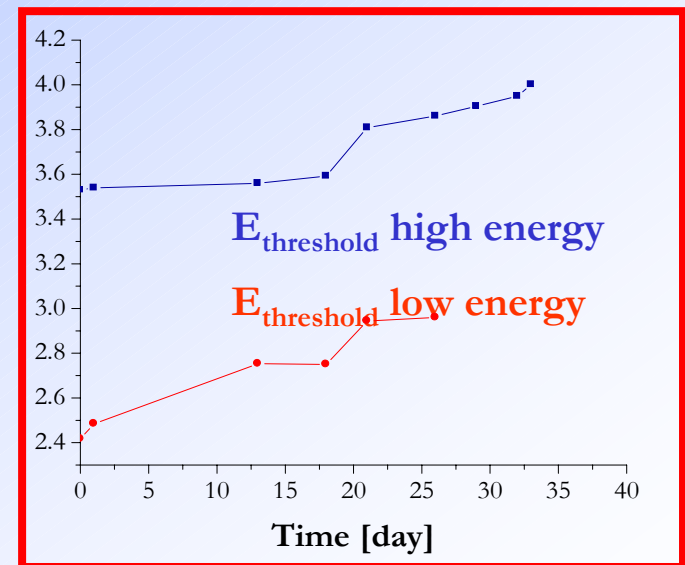
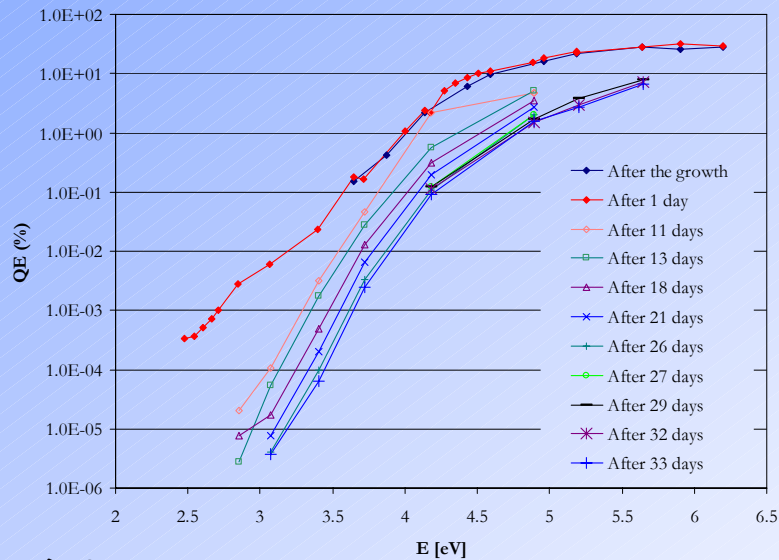
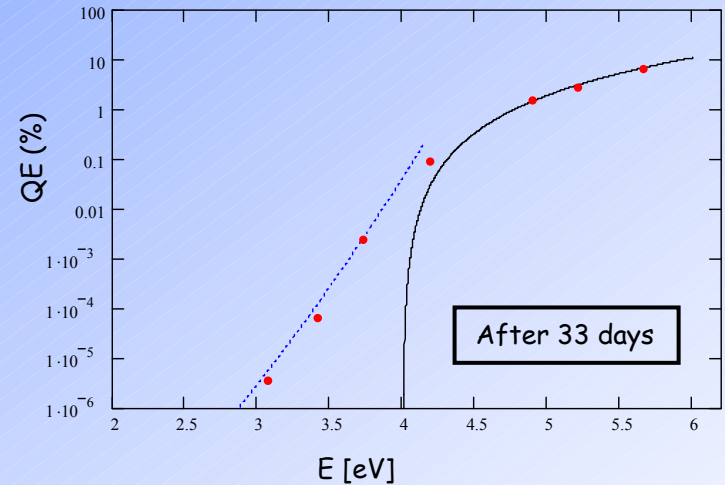
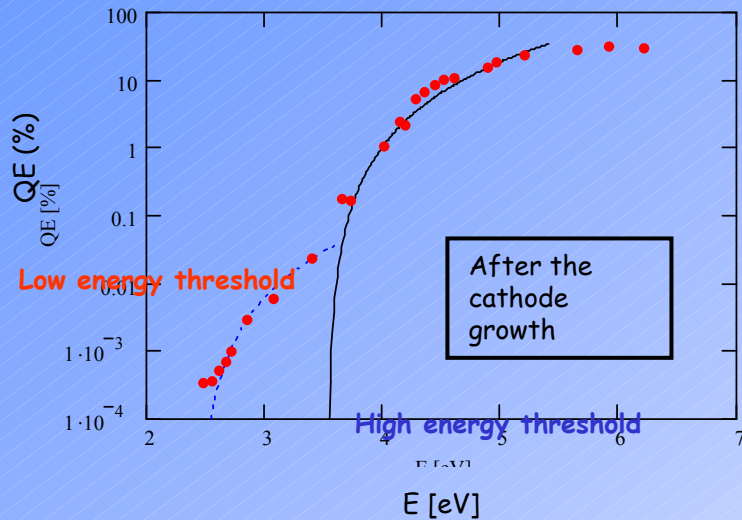


Cs₂Te Optical Properties

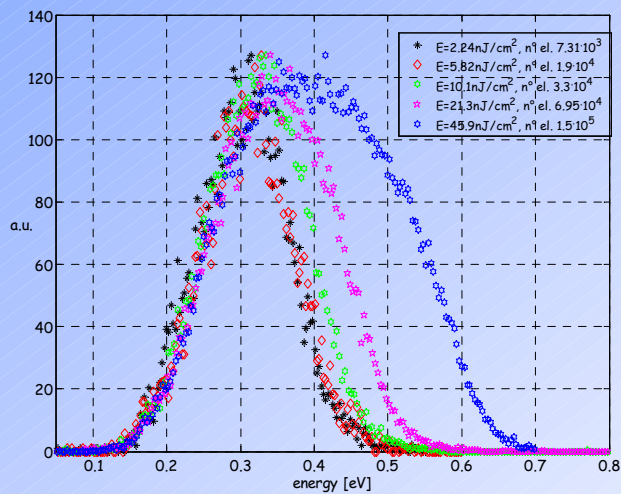
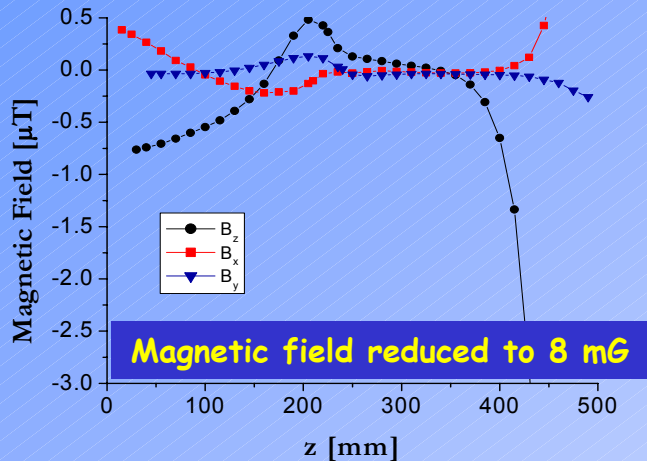


n	k	σ [nm]	thickness [nm]
1.75	0.356	0	38.5

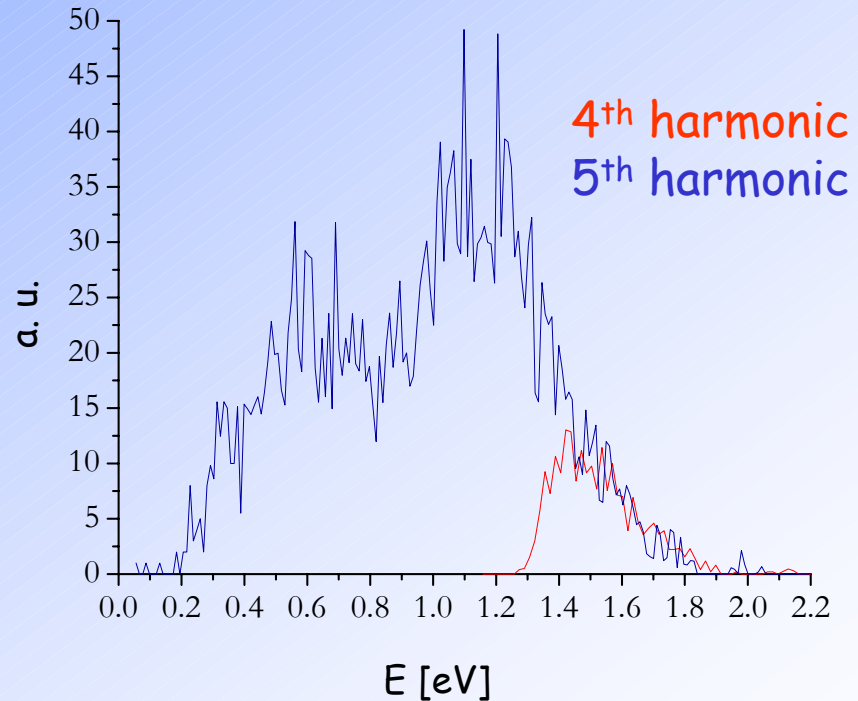
Cs₂Te QE & photoelectric threshold vs. time



Cs₂Te - TOF upgrade



Space charge effect > 20000 e⁻



First spectra with 5th harmonic