

**INDIAN INSTITUTE OF TECHNOLOGY KANPUR**  
**Department of Physics**  
**Kanpur - 208016, India**

**Dr. Soumik Mukhopadhyay**

Assistant Professor  
Department of Physics  
IIT Kanpur  
Kanpur - 208016, India

e-mail: soumikm@iitk.ac.in  
Tel: +91-512-259-6276/6784

Enquiry no.: PHY/SoM/EQP/2013/1

Enquiry date: 30/08/2013

Closing date: 09/09/2013

**Request for submission of quotation for “Upgradation of existing Magnetolectric response measurement system”**

Dear Sir/Madam,

Sealed quotation(s) are required on or before September 9th latest by 3 PM meeting all technical specifications as mentioned below:

**Terms and conditions:**

Quotations should have a validity of a minimum of 60 days.

The equipment should be provided with a minimum warranty of 1 year.

Quotations are required in duplicate in a sealed envelope with enquiry number mentioned on the envelope.

The delivery period should be specifically stated.

The rate offered should be F.O.B (specify city).

Institute is exempted from payment of Excise Duty under notification no.10/97.

Institute is entitled to avail concession rate of sales tax as admissible under Sub-sec 5 of Sec 8 C.S.T Act 1956 applicable to Educational/Research institution in inter-state purchase.

**REQUIREMENTS/SPECIFICATIONS**

We want to add High Voltage Interface, High Voltage Amplifier and High voltage test fixture to upgrade our existing magnetolectric measurement response system for higher voltage requirement, particularly for Bulk Ceramic related application. The following items are needed.

- 1 High Voltage Interface Unit to +/-10,000V
2. High Voltage Amplifier Unit to +/-10,000V
3. High Voltage Test Fixture

**General Specifications for the upgraded system:**

- 1.** The system is intended to investigate the P-E hysteresis, CV, IV as a function of applied DC & AC magnetic field & temperature for non-piezoelectric thin film/ heterostructures and **bulk samples.**
- 2.** Magnetoelectric Response Task capability to measure magnetoelectric (ME) coupling coefficients as a function of magnetic field and temperature for thin film/ heterostructures and **bulk samples.**
- 3.** Measurement as a function of magnetic field on a sample while measuring its charge generation.
- 5.** The test frequency must extend from a test period of 30 seconds for accurate measurement of large area bulk ceramic capacitors down to 10ms for characterizing small-scale but leaky thin-film capacitors. Pulse measurements should be as narrow as 1 $\mu$ s.
- 6.** The minimum required leakage resolution should be 2pA and the parasitic input capacitance must be less than 100 femtofarads.
- 7.** The voltage ramp rate of the output must be controlled such that the current capacity of the measurement input is not exceeded during a test.
- 8.** The output of the test system must be an arbitrary waveform generator in order to produce any waveform for hysteresis, pulse, leakage, and CV tests without a hardware configuration change.
- 9.** The software controlled testing equipment should be capable of executing all measurements with provision for automatic data storage and transfer to other testers using network protocols.

**Soumik Mukhopadhyay**  
Dept. Physics  
IIT Kanpur