



Contribution ID: 17

Type: **contributed talk**

## Compact IV/CV measurement instrument for silicon sensors

*Wednesday, 19 February 2020 15:20 (20 minutes)*

IV and CV curves are crucial measurements required to characterise silicon sensors. They have to be performed at reception and at several steps of particle detector modules assembly procedure to spot potential damages, at least in the prototyping phase.

High voltage (1kV) biasing of those sensors and accurate, low current measurements (50 $\mu$ A max) are mandatory for this. Typical instruments to perform those measurements are high voltage electrometers and LCR meters with proper decoupling. Those instruments are rather expensive (10k euros range) and commonly have over-specifications for this precise task. We developed a system tailored to perform both IV and CV measurements of sensors in one compact, lower cost instrument. It is based on a PCB that implements a low ripple (100mV) 1kV high voltage power supply, high-side AC/DC current measurement with 15nA granularity. Coupled with an external signal generator and a computer that extracts electrical parameters and IV/CV curves, a Programmable System-On-Chip (PSOC) handles sources control in addition to current, voltage and voltage/current phase measurements. On top of that, temperature, relative humidity are monitored and low voltage DC regulators can supply readout electronics of a fully assembled module to provide a standalone test station usable in sensor/module characterisation or in thermal cycling.

**Primary authors:** VANLAER, Pascal (Universite Libre de Bruxelles (BE)); DE LENTDECKER, Gilles (Universite Libre de Bruxelles (BE)); ALLARD, Yannick (Universite Libre de Bruxelles (BE)); SAFA, Ali (Universite Libre de Bruxelles (BE)); Prof. ROBERT, Frédéric (Université Libre de Bruxelles)

**Presenter:** SAFA, Ali (Universite Libre de Bruxelles (BE))

**Session Classification:** Materials, Characterisation, Electronics

**Track Classification:** Characterization (TCT and others)