

NATIONAL METROLOGY INSTITUTE OF SOUTH AFRICA (NMISA)

Progress Report on Activities in Electricity and Magnetism

Prepared for the 30th meeting of the CCEM, 20-24 March 2017

This report presents a short summary of technical work in the DCLF and RF laboratories of NMISA (South Africa).

17025 ACCREDITATION AND PEER REVIEW

The national accreditation body, SANAS, carried out a full re-assessment of the DCLF laboratory capabilities in compliance with ISO/IEC 17025 in March 2016. The capabilities of the RF laboratory were fully re-assessed by SANAS in November 2016. The assessments involved technical peer evaluation by the respective area experts from NIM (DCLF capabilities – Dr. Jiangtao Zhang) and PTB (RF capabilities - Dr. Karsten Kuhlmann).

RF LABORATORY

With the help of NPL's technical experts in November 2016, the laboratory commissioned a voltage ratio attenuation measurement system using an inductive voltage divider (IVD) as a primary standard and a digital voltmeter as a detector. The system operates in the 30-50 MHz frequency range.

A new reflectometer system was commissioned with the intention to extend the frequency scope down to 9 kHz and up to 67 GHz.

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DCLF LABORATORY

Capacitance

The laboratory participated in the BIPM-piloted bilateral comparison on the capacitance standards (10 pF and 100 pF) – BIPM.EM-K14.a and BIPM.EM-K14.b. Draft B report was released in September 2016. The comparison produced good equivalence results between the laboratories.

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Resistance

The laboratory is scheduled for participation in the bilateral resistance comparison with BIPM, with the NMISA measurement round to take place in March 2016.

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AC-DC Transfer Difference

A set of the shunt/PMJTC-based thermal current conversion standards, which are rated from 2 mA up to 100 A (10 Hz to 100 kHz), were commissioned to serve as the new national standards in the ac-dc current transfer difference. The extension of the ac current capability up to 100 A is an emerging request from the national industry with the applications in calibration of current shunts and transconductance amplifiers.

The laboratory participated in the APMP.EM-K12 comparison (ac-dc current transfer at 10 mA and 5 A, 10 Hz to 100 kHz). The NMISA measurements were completed in June 2015.

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AC Power

The laboratory registered to participate in CCEM-K5 (primary power at 120 V and 240 V, 5 A, 53 Hz); the NMISA measurement round is scheduled for August-September 2018.

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