

# **New Trends in Metrology at the Slovak Metrology Institute**

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## **Abstract**

The Slovak metrology Institute (SMI) is the state metrology institution whose aim is to assure uniformity and accuracy of measurements as well as a full compatibility of the Slovak metrology system with metrology systems of other countries. This is performed through development and maintenance of national measurement standards and by providing various metrology services.

Considering the permanently increasing demand to enlarge and improve the measurement capabilities the Slovak Government has adopted the state policy conception, a part of which is concerned with new trends in metrology. It covers metrology:

for quality of life, i.e.

- metrology of high energy proton and neutron beams aiming at development of the primary standards for metrology of proton (ion) beams at cyclotron facilities in the energy range from 20 to 70 MeV,
- metrology of high energy neutrons based on high energy quasi monoenergetic neutron reference field,
- research of alanin/EPR dosimetry for application in radiotherapy including proton therapy,
- metrology for health protection considering influence of some measuring methods on patients (e.g. ultrasonic diagnosis), correlation of the electronic smog with living organisms (mobile nets, wireless electronic equipment),
- environment protection based on exact monitored data related to the CRMs,
- metrology assurance of measuring instruments of hidden radioactivity,
- metrology of short-live radionuclides including application of relevant CRMs in the field of nuclear medicine,
- development of new carriers for nuclear medicine area;

of new and improved quantities, i.e.

- metrology of electrical quantities including further elaboration of standards based on the Josephson and Hall phenomena both for unidirectional and alternating current,
- primary standard of current based on one-electron tunnelling leading to the primary standard of capacity,
- relations between nanometrology and the classic understanding of metrology,
- realization of unit and scale in the field of luminance intensity,
- realization of the new definition of kelvin and temperature scale by means of spectroradiometric methods and means,
- metrology of dynamically loaded materials etc.

All these activities will make a part of the proposed iMERA project within the frame of international research.