



## Quality assurance project for the magnetic calibration and test laboratory of the Nurmijärvi Geomagnetic Observatory

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The magnetic calibration and test laboratory of the Nurmijärvi Geomagnetic Observatory is aimed for magnetometer and compass calibrations, for magnetic cleanliness measurements and for compass swing base measurements at airfields. The increased importance of space industry has given rise to the development of the quality system for the calibrations and tests.

The European standard EN ISO/IEC 17025:2000 states the demands for the quality system. This standard has been followed both for technical and management requirements. We will describe main technical parameters and competence of the laboratory. Traceability to the international standards is fulfilled and comparisons with other laboratories have been made.

The extended ( $k=2$ ) standard uncertainties, as specified in the EA-4/02 publication, for the magnetometer calibration system are the following:

Transformation coefficients (-10 °C ... +60°C)	$\pm 0.03\%$
Angles between sensors	$\pm 0.02 \text{degrees}$
Angles between magnetic and mechanical axes	$\pm 0.03 \text{degrees}$
Offsets of the sensors	$\pm 1nT$
Temperature drift (+20°C ... +60°C)	$\pm 0.03nT/^\circ C$

A controlled heating system exists for temperature tests. An optical orientation system is used for determining the direction of the magnetic axes with respect to the mechanical axes of the sensor.

Magnetic cleanliness tests are aimed for satellite instruments and components. Units

with weight up to 30 kg and dimensions up to 0.5 m can be measured on a rotating table in zero fields. Demagnetising and magnetizing allow testing the hard and soft magnetic materials.