Proton and Overhauser magnetometers metrology

V. Sapunov, A. Denisov, O. Denisova, D. Saveliev
Quantum Magnetometry Laboratory, Ural State Technical University[1]

A b s t r a c t: Some of the principal experimental and theoretical results concerning metrological parameters of proton and Overhauser magnetometers are studied. In particular, the effect of operating modes, processing algorithms, sensor design and registration path on the absolute and random errors of geomagnetic field is discussed.

The methods of testing and metrological certification used by the laboratory in producing magnetometers are considered in this report. In particular, the simplest laboratory testing, testing by means of special laboratory standard based on a magnetic shield, and the certification with a reference magnetometer under the conditions of standard magnetic field are described.

The measurement systematic error resulting from the thermoelectromotive force generated at the polarization or in the presence of a temperature gradient is shown for proton and Overhauser sensors. Methods for this defect removal are offered.

Key words: proton magnetometer, Overhauser magnetometer, metrology

[1]Mira str. 19, 620002, Ekaterinburg, Russia
e-mail: sva@dpt.ustu.ru