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System of active regulation of the temperature and temperature gradient in nuclear magnetic resonance sensors

Kashirin N., Skirda V., Idiyatullin D., Sevryugin V.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

An active system of temperature regulation and temperature gradient in a sample on the example NMR sensor is described in this work. By supporting the given average temperature, the system of temperature-stabilization allows one to set and supervise the size and direction of the temperature gradient along a sample. The temperature of a sample is maintained with an accuracy of about $\pm 0.1^{\circ}\text{C}$ in a temperature interval of -150 to $+200^{\circ}\text{C}$ with a longitudinal temperature gradient no more than $\pm 0.2^{\circ}\text{C}$. The value of the temperature gradient is established in the range of 0° to 10°C/cm in both directions.
