

The paper demonstrated the possibility of using temperature dependence of the Debye-Waller diamond factor with high concentration of NV centers for thermometry. The temperature Sensitivity $\approx 0,15 \text{ K Hz}^{-0.5}$.

It was determined that fiber-optic probes are suitable for measuring in living animal and are able to record changes in temperature in response on the physiological impact in a fully fiber format. This the result offers the opportunity to work with free-mobile animals when combined with technologies of thermogenetics.

The method of measurement was proposed and experimentally implemented mouse brain temperature, fully compatible with multiphoton microscopy and thermogenetic activation. Temperature control at diamond microparticles provided the opportunity for temperature of the upper layers of the mouse brain and minimization of undesirable temperature changes due to overheating during microscopy or unaccounted cooling.