The press service of the Ministry of Education and Science of the Russian Federation reported that Russian and German scientists have developed a new approach to the study of nuclear spins in two-dimensional materials. The work was carried out using boron hexagonal nitride (HBN), known as the White Grafen, and can lead to the creation of a new generation of quantum devices.

Researchers paid special attention to the study of defects in the crystal lattice of the material-the missing boron atoms (VB-defects). These defects have unique quantum properties, including almost 100% optically induced spinal polar polarization at room temperature.

The international team of scientists from Kazan Federal University, Institutes of the Russian Academy of Sciences and the University of Paderman (Germany) used methods of impulse spectroscopy of electronic paramagnetic resonance. This made it possible to study the interactions between the electronic backs of the defects and the remote nuclear spins of nitrogen.

As explained by the research officer of the “promising platforms for spin quantum manipulations” Fadis Murzakhanov, the work gives a new understanding of spin interactions in atomic subtle materials. The results can be used to create highly sensitive quantum sensors, computing devices and quantum systems.