The press service of the Ministry of Education and Science of the Russian Federation reported that scientists of Kazan Federal University proposed a new approach to creating quantum devices based on silicon carbide. Development can become the basis for the production of scalable quantum chips with high reliability indicators.

Unlike diamond, which is available only in the form of small crystals, silicon carbide is an industrial semiconductor. For him, the cultivation of large substrates with a diameter of up to 200 millimeters has been mastered. This allows you to use standard methods of semiconductor technology, including lithography and etching.

Scientists studied the Azot-Vakancion Centers in the crystal of the silicon carbide of the Politype 6H. These centers have unique quantum properties. The experiments showed a high coefficient of transformation of optical radiation into spinal magnetization, which allows the use of systems as a connecting element between spin centers and photons.

An important advantage has been a long time of the life of spin defects – up to a second range. This property is of key importance for storing quantum information.

Optical transitions in the crystal occur in the near infrared region, which makes the development of long distances promising for quantum communications. Studies are conducted in conjunction with the Physics and Technical Institute named after A.F. Ioffe RAS.