

March 25, 2024

Sergei P. Kulik

*Liouville foliation of planar billiards in
magnetic and potential field*

Significant progress in the technology of physical experiments at the end of the 20th and beginning of the 21st centuries also led to the rapid growth of a family of technologies aimed at building quantum computing devices. The theoretical foundations required for this can be considered well developed over the past 30 years; The problem is how to implement existing theoretical knowledge into specific devices, as was done in the second half of the 20th century with classical computers.

The talk provides a brief overview of the state of the Quantum Computing industry, examining the main physical platforms — quantum computing based on neutral atoms and ions in traps, based on superconducting circuits and photonic chips. The situation in the Russian Federation is considered separately. Basically, the emphasis is placed on only one criterion aspect of quantum computing — scaling when taking into account quantum errors. Several examples show the scale of the “disaster” — estimates of the necessary resources can hardly be called optimistic. At the same time, the Author, who has been working in the field of quantum technologies for a long time, is by no means a pessimist; rather, the position taken belongs to the category of “realistic optimists”.