**Abstract**

We provide a series of quantum algorithms from the less elaborate to the most complex one. However, the last and more elaborate of these quantum algorithms has running time polynomial at the worst case for all inputs. It is based on a classical deterministic polynomial-time algorithm, which is presented rigorously. The latter proves indirectly that **P** = **NP** for the Sub-Graph Isomorphism problem is **NP**-complete**.** (A detailed study of the **P** vs. **NP**, one can find in one of my papers to be published in the *Nature Communications* journal.) Therefore it is shown that the class **NP** belongs to the **BQP** quantum complexity class. We analyzed the most general and complicated cases of pairs of input graphs (A, B), where B is matched isomorphically into A. Finally, we prove that the last quantum algorithm could most probably run significantly faster than the classical counterpart on all possible instances (A, B).