

## ALGORITHMES QUANTIQUES, CYCLES HAMILTONIENS ET LA *k*-COLORATION DES GRAPHES

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Abstract

We prove the existence of the Feynman quantum algorithm, polynomial and of the order  $\mathcal{O}(n^3)$  which inform us about the presence of the Hamiltonian cycles in a graph with cardinality *n* and in this case allows us to find them completely. And we also prove the existence of the Pauli quantum algorithm with the order  $\mathcal{O}(n^3)$  which enable us to know whether the *k*-coloring graph is possible and make us this coloration if it is possible.

**Keywords and phrases:** graph, hamiltonien, cycle hamiltonien, P = NP, voyageur de commerce, *k*-coloration des graphes, algorithme, algorithme quantique, théorie de la complexité.

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