SEMINARIO
Departamentos de Física Teórica I y II
Universidad Complutense de Madrid

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TITULO: **Complexity of the Quantum Adiabatic Algorithm**

LUGAR: FACULTAD DE CIENCIAS FÍSICAS UCM
DÍA: 4 de septiembre, 2012 (Martes)
HORA: 14:30
AULA: Seminario Depto. Física Teórica I, Planta 3ª

ABSTRACT

The Quantum Adiabatic Algorithm (QAA) has been proposed
as a mechanism for efficiently solving optimization problems on a
quantum computer. Here, we discuss several applications of the algorithm
and analyze its efficiency by considering several hard problems. This
is done mainly by studying the size dependence of the typical minimum
energy gap of the Hamiltonian using quantum Monte Carlo methods.
While for most problems we find that the minimum gap decreases
exponentially with the size of the problem, indicating that the QAA is not
more efficient than existing classical search algorithms, for other problems
there is evidence to suggest that the gap may be polynomial near the
phase transition.