Simposio de Tecnologías Cuánticas

Quantum Technologies Symposium

Madrid, 21 y 22 de noviembre de 2018 / November 21-22 2018

ABSTRACT

Solving quantum problems with quantum computers

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In this talk I will address the difficulty of classical computers to solve problems in quantum many-body systems and how quantum computers can considerably speed-up their solution. First, I will review how one can simulate the dynamics of such systems efficiently with quantum devices. Then, I will introduce other algorithms based on phase estimation and amplitude amplification to prepare the state at zero temperature. Finally, I will mention how those and other algorithms could be used with classical problems that can be encoded in the zero temperature states of quantum many-body systems.