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Presentation Title

Progress, Applications, and Perspectives in Systems and Control Tools

Abstract

We have provided a unifying optimal control programming package DYNAMO [Phys. Rev. A 84 (2011) 022305]. For all standard tasks in closed and open systems such as quantum- state transfer, unitary quantum-gate synthesis, or the generation of quantum maps for controlled channels there are ready-to-use modules in MATLAB. These modules comprise state-of-the-art algorithms comprising sequential (Krotov-type) and concurrent (GRAPE-type) update rules with first-order and second-order gradient information even allowing to switch methods in order to ensure to be always on the fastest algorithmic track.

Building upon these achievements, we will next exploit the dynamic characteristics of the NV-centre settings to obtain tailored and long-lived quantum states for quantum-information processing.