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A NONLINEAR ROBUST CONTROL APPROACH TO STABILIZATION OF THE QUANTUM SPIN 1/2 SYSTEM REPRESENTED BY A REAL-TYPE STOCHASTIC DIFFERENTIAL EQUATION

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Abstract

This paper considers a robust control problem for the quantum spin-1/2 systems represented by a real-type stochastic differential equation. The aim of this paper is to propose the control law that makes the quantum state converge a selected equilibrium point of the system. From the view point of nonlinear H-infinity control theory, a control law that suppresses disturbance and achieve the control objective is derived. A modification of the controller is also developed. Numerical simulations demonstrate the efficiency of the new approach. In addition, it turns out that the control law is also effective in the case where the system have parameter errors.

Key Words : *Quantum System, Spin 1/2 System, Stabilization, Robust Control, Nonlinear H-infinity Control.*