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Qin Zhang* (qzhang5@ncsu.edu), Department of Mathematics, Box 8205, North Carolina State University, Raleigh, NC 27695, and **Kazufumi Ito** (kito@math.ncsu.edu), Department of Mathematics, Box 8205, North Carolina State University, Raleigh, NC 27695. *A Nonsmooth Feedback Solution for a Class of Quantum Control Problems.*

We consider the optimal control problem of the quantum systems described by the Schrödinger equation. Control inputs enter through coupling operators and results in a bilinear control system. Nonsmooth feedback control laws are developed for the orbit tracking via a controlled Hamiltonian. Wellposedness and asymptotic tracking properties of the feedback laws are analyzed. Numerical integrations via time-splitting are also analyzed and used to demonstrate the feasibility of the proposed feedback laws. Next, a monotone scheme for the solving the optimality system is described. Finally, we develop the receding horizon control synthesis, which improves the performance of the proposed feedback laws significantly. (Received September 03, 2008)