

**OPERATOR VALUED STOCHASTIC CONTROL IN FOCK SPACE WITH
APPLICATIONS TO ORBIT TRACKING AND NOISE FILTERING**

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Abstract: The control process that minimizes the quadratic performance functional associated with a quantum system whose evolution is described by a Hudson-Parthasarathy type stochastic differential equation in Fock space is explicitly computed. A “noisy” infinite-dimensional Riccati equation appears for the first time and it is shown to have a unique solution. The solution to the control problem is used to derive the Fock space analogue of the Bucy-Kalman filter. The solution to an associated optimal trajectory problem is also obtained.

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