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Linear-quadratic control for stochastic equations in a Hilbert space with a fractional Brownian motion

A linear-quadratic control problem for some infinite-dimensional controlled stochastic differential equations driven by a fractional Gaussian noise is solved: The feed-back form of the optimal control and the optimal cost are given. The optimal control contains a prediction of the system response to the future noise. The covariance of the noise as well as the control operator may in general be unbounded, so the results can also be applied to the case of boundary/point noise and control. Some examples are given.