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Adaptive Control of a Linear Stochastic System with a Fractional Brownian Motion

An adaptive control problem is formulated and solved for a linear stochastic system perturbed by a fractional Brownian motion and an ergodic quadratic cost functional. A strongly consistent family of estimators of the unknown parameter is exhibited and an adaptive control is given that is shown to be self-optimizing. The Hurst parameter for the fractional Brownian may take any value in $(\frac{1}{2}, 1)$.