Set-based corral control in stochastic dynamical systems: Making almost invariant sets more invariant[1] ERIC FORGOSTON, LORA BILLINGS, PHILIP YECKO, Montclair State University, IRA SCHWARTZ, Naval Research Laboratory — We consider the problem of stochastic prediction and control in a time-dependent stochastic environment, such as the ocean, where escape from an almost invariant region occurs due to random fluctuations. We determine high-probability control-actuation sets using geometric and probabilistic methods. These methods allow us to design regions of control that provide an increase in loitering time while minimizing the amount of control actuation. Our methods provide an exponential increase in loitering times with only small changes in actuation force. The result is that the control actuation makes almost invariant sets more invariant.

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