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*Markov-modulated two-sided Skorohod reflection of Brownian motion.*

ABSTRACT: We consider a Brownian motion forced to stay between two barriers through reflection. In addition we assume that according to an external and independent finite-state Markov chain the drift and diffusion components of the Brownian motion change together with the level of the two barriers. For this process we show how to compute the stationary distribution by solving a set of linear systems of differential equations. This model has direct application to the case of fluid Brownian queues whose buffer level is Markov modulated. As a second application we use this model to determine optimal dividend-payment strategy for an insurance company. (Joint work with Offer Kella.)

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