Stabilization by multiplicative Itô noise for Chafee-Infante equation in perforated domains

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The stabilization by noise for parabolic equations in perforated domains, i.e. domains with small holes, is investigated. We show that when the holes are small enough, one can stabilize the unstable equations using suitable multiplicative Itô noise. The results are quantitative, in the sense that we can explicitly estimate the size of the holes and diffusion coefficients for which stabilization by noise takes place. This is done by using the asymptotic behaviour of the first eigenvalue of the Laplacian as the hole shrinks to a point.