SOJOURN TIME OF SOME REFLECTED BROWNIAN MOTION IN THE UNIT DISK

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Abstract: We study the heat diffusion in a domain with an obstacle inside. More precisely, we are interested in the quantity of heat in so far as a function of the position of the heat source at time 0. This quantity is also equal to the expectation of the sojourn time of the Brownian motion, reflected on the boundary of a small disk contained in the unit disk, and killed on the unit circle. We give the explicit expression of this expectation. This allows us to make some numerical estimates and thus to illustrate the behaviour of this expectation as a function of starting point of the Brownian motion.