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# SUPREMUM DISTRIBUTION OF BESSEL PROCESS OF DRIFTING BROWNIAN MOTION

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*Abstract:* Let us assume that $(B_t^{(1)}, B_t^{(2)}, B_t^{(3)} + \mu t)$ is a three-dimensional Brownian motion with drift $\mu$, starting at the origin. Then $X_t = \|(B_t^{(1)}, B_t^{(2)}, B_t^{(3)} + \mu t)\|$, its distance from the starting point, is a diffusion with many applications. We investigate the supremum of $(X_t)$, give an infinite-series formula for its distribution function and an exact estimate of the density of this distribution in terms of elementary functions.

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