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ON PAUL LÉVY'S ARC SINE LAW AND SHIGA-WATANABE'S TIME INVERSION RESULT

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Abstract: Let $((X_t), \mathbf{P})$ be a symmetric real-valued H-self-similar diffusion starting at 0. We characterize the distributions of A_t the time spent on $(0, \infty)$ before time t, and g_t the time of the last visit to 0 before t. This gives a simple new proof to well-known results including P. Lévy's arc sine law for Brownian motion and Brownian bridge and similar results for symmetrized Bessel processes. Our focus is more on simplicity of proofs than on novelty of results. Section 3 contains a generalization of T. Shiga's and S. Watanabe's theorem on time inversion for Bessel processes. We show that their result holds also for symmetrized Bessel processes.

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