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The distribution of continuous time rank processes

Takahiko Fujita[1] and Ryozo Miura[2]

[1] Graduate School of Commerce and Management, Hitotsubashi University,Naka 2-1, Kunitachi, Tokyo, 186-8601, Japan

[2] Graduate School of International Corporate Strategy,Hitotsubashi University, 2-1-2 Hitotsubashi, Chiyodaku, Tokyo,101-8439, Japan

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Abstract. In this paper, we will give exact calculations of probability disrtributions of continuous rank processes in Brownian case, Brownian motion with drift case, Pinned Brownian motion case. These calculations are based on the results of the joint distributions of Brownian motion and its soujourn time. Also we give new exotic options using rank statistics and calculate the price of rank options.

Key words: rank statistics, rank process, Brownian motion, Brownian motion with drift, Brownian bridge, Black Scholes model