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Abstracts of Short Communications and Posters

Section:

12. Probability and Statistics

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On the moments of the area functional of Brownian bridge

Let b_t; $0 \le t \le 1$, be a Brownian bridge from 0 to 0, and let $\ell(u)$ be the total local time of $|b_t|$ at u. For $n \ge 0$, set $G_n(x) = E((\int_0^1 |b_t|\ dt)^n \mid \ell(0) = x)$, i. e. the conditional moments of the absolute area given the local time at 0. We obtain a recursion formula for $G_n(x)$, in the form

$$G_n(x) = (\exp \frac{x^2}{16}) \sum_{i=0}^{n-1} d_{n+2i,n} D_{-n-2i}(\frac{x}{2})$$

where D_{-k} are the parabolic cyclinder functions, $d_{1,1} = \frac{1}{2}$, and $d_{k,n}$, $1 < n$, are determined by the recursion equations

$$d_{n+1+2i,n+1} = 2^{i-1}\Gamma(\frac{n+1}{2}+i) \sum_{j=0}^{i\wedge(n-1)} (2^j \Gamma(\frac{n+1}{2}+j)(n+1-j))^{-1} d_{n+2j,n}\ .$$