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**Wenbo V. Li\*** (wli@math.udel.edu), 501 Ewing Hall, Newark, DE 19716. *Probability Estimates for Brownian Sheets.*

We first provide an overview on fundamental roles of small value probability (estimates of rare events that positive random variables take smaller values) in the theory of stochastic processes. As two important fields of study, we consider the small deviation probability (two-sided boundary crossing)

$$\log P\left(\sup_{\mathbf{t} \in [0, T]^d} |W(\mathbf{t})| \leq 1\right), \quad \text{as } T \rightarrow \infty$$

and the lower tail probability (one-sided boundary crossing)

$$\log P\left(\sup_{\mathbf{t} \in [0, T]^d} W(\mathbf{t}) \leq 1\right), \quad \text{as } T \rightarrow \infty$$

for Gaussian random fields. Here we focus on the illustrating example that  $W(\mathbf{t})$  is a Brownian sheet (tensored Brownian motion or space-time noises) used in stochastic partial differential equations. (Received August 28, 2009)