

# ASYMPTOTICS RELATED TO GENERALIZED SELF INTERSECTION LOCAL TIMES OF BROWNIAN MOTION

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Let  $B(t)$  be a Brownian motion in  $\mathbb{R}^d$ . The double self intersection local time at a point  $u \in \mathbb{R}^d \setminus \{0\}$  is the local time at  $u$  of the random field  $X(s, t) = B(t) - B(s)$ . We denote it by  $\rho(u)$ . Formally, it can be written as

$$\rho(u) = \int_{\Delta_2} \delta_u(B(t) - B(s)) ds dt,$$

where  $\Delta_2 = \{(s, t) \in [0, 1]^2; s < t\}$ . If  $d \geq 4$  then  $\rho(u)$  is a positive generalized Wiener function which can be represented as a measure  $\theta_u$  on the Wiener space

$$W_0^d = \{\omega : [0, 1] \rightarrow \mathbb{R}^d \mid \omega \text{ is continuous and } \omega(0) = 0\}.$$

We provide some asymptotics for the generalized self intersection local time  $\rho(u)$ , when  $u$  tends to 0, in terms of the measures  $\theta_u$ . The main results are related to the measure of the whole space  $\theta_u(W_0^d)$  and the capacity of the support of  $\theta_u$ .