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David Nualart* (nualart@math.ku.edu), University of Kansas, Department of Mathematics, Lawrence, KS 66045. *Self-intersection local time of the fractional Brownian motion.*

The self-intersection local time of a d -dimensional fractional Brownian motion with Hurst parameter $H \in (0, 1)$ on a time interval $[0, T]$ is formally defined as the limit in L^2 as ϵ tends to zero of

$$L_\epsilon = \int_0^T \int_0^t p_\epsilon(B_t^H - B_s^H) ds dt,$$

where p_ϵ is the heat kernel with variance ϵ . This local time exists in L^2 if $Hd < 1$. For $1 \leq Hd < \frac{3}{2}$ the Varadhan renormalization is introduced as the limit in L^2 of $L_\epsilon - E(L_\epsilon)$.

In this talk we derive a stochastic integral representation for the renormalized self-intersection local time using Clark-Ocone's formula. As an application we will show the existence of exponential moments for the renormalized self-intersection local time. This is a joint work with Yaozhong Hu and Jian Song. (Received June 19, 2008)