MOUVEMENTS BROWNIENS ASYMÉTRIQUES MODIFIÉS EN DIMENSION FINIE ET OPÉRATEURS DIFFÉRENTIELS À COEFFICIENTS DISCONTINUS

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Abstract: We consider a partial differential equation of parabolic type on $\mathcal{E} = \mathbb{R}^d$ ($d \in \mathbb{N}^*$),

$$
\frac{\partial u}{\partial t}(x, t) = Lu(x, t), \quad x \in \mathcal{E}, \ t \in \mathbb{R}_+, \\
u(x, 0) = f(x), \quad u(\cdot, t)/\partial \mathcal{E} = 0
$$

where $L = (C_1V + D_1W)\Delta + \delta_S A \nabla$, $V$ and $W$ being two subdomains of $\mathcal{E}$ such that $\mathcal{E} = V \cup W \cup S$, $V \cap W \neq \emptyset$ and $S$ being a $C^2$-variety. The functions $C$ and $D$ are $C^2$ on $\mathcal{E}$, $\delta_V$ is the surface-vector-measure on $S$, $A$ is a function defined on $S$ which will be precised later on, $\delta_S A$ is a generalized drift, $\nabla$ [resp. $\Delta$] is the classical gradient [resp. Laplacian operator] on $\mathbb{R}^d$.

We give, via a modified skew Brownian motion, a stochastic resolution of (1) - $L$ being considered as a generalized infinitesimal generator - and we study the continuity properties of the transition probability densities and of their derivatives at the neighborhood of $S$.

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