

Generalized stochastic Dirichlet problem

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We present results concerning the stochastic Dirichlet problem $L \nabla u = h + f$ in the framework of white noise analysis combined with Sobolev space methods. The input data and the boundary condition are generalized stochastic processes regarded as linear continuous mappings from the Sobolev space $W_0^{1,2}$ into the Kondratiev space $(S)_1$. The operator L is assumed to be strictly elliptic in divergence form $L \nabla u = (A \nabla u + b \nabla u) + c \nabla u + d \nabla u$. Its coefficients: the elements of the matrix A and of the vectors b ; c and d are assumed to be generalized random processes, and the product of two generalized processes, denoted by ∇ , is interpreted as the Wick product. We prove the weak maximum principle for the operator L and that this equation with a given stochastic boundary condition has a unique solution.