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Mehmet E San* (mehmetsan@fatih.edu.tr), Department of Mathematics Fatih University, Hadimkoy Yolu Uzeri, Akcaburgaz Mevkii, 34500 Istanbul, Turkey. *On The Numerical Solution of Parabolic Stochastic Differential Equation.*

"We are interested in studying the stable difference schemes for the approximate solutions of the nonlocal boundary value problem for parabolic stochastic differential equation

$$du(t) + Au(t)dt = f(t)dw_t \quad (0 \leq t \leq T), u(0) = u(T) + \varphi w_T$$

in a Hilbert space H with self-adjoint positive definite operator A . Here, W_t is a standard Wiener process given on the probability space (Ω, F, P) .

In the present paper the first and second orders of accuracy difference schemes for approximately solving this nonlocal boundary value problem are presented. The convergence estimates for the solution of these difference schemes are established. A numerical method is proposed for solving the stochastic parabolic partial differential equation with nonlocal boundary condition. The first and second order of accuracy difference schemes are presented. A procedure of modified Gauss elimination method is used for solving these difference schemes in the case of a one-dimensional stochastic parabolic partial differential equation. The method is illustrated by numerical examples." (Received June 26, 2007)