Meeting: 1006, Lubbock, Texas, SS 9A, Special Session on Theory and Application of Stochastic Differential Equations

1006-65-26 **Armando Arciniega*** (armando.arciniega@utsa.edu), Department of Applied Mathematics, The University of Texas at San Antonio, 6900 North Loop 1604 West, San Antonio, TX 78249, and **Edward J. Allen** (eallen@math.ttu.edu), Department of Mathemacs & Statistics, Texas Tech University, P.O. Box 41042, Lubbock, TX 79409. *Rounding Error In Numerical Solution of Stochastic Differential Equations.*

The study of stochastic differential equations plays a prominent role in a range of application areas. When a differential equation model for some physical phenomenon is formulated, one would like to obtain the exact solution. However, even for ordinary differential equations this is generally not possible and numerical methods must be used. The present investigation is concerned with estimating the rounding error in numerical solution of stochastic differential equations. A statistical rounding error anlaysis in Euler's method for numerical solution of stochastic differential equations is performed. It is shown that the rounding error is inversely proportional to the square root of the step size. An extrapolating technique is applied to functional expectation of the numerical solutions. Richardson extrapolation provides second-order accuracy, and is one way to increase accuracy while avoiding rounding error. (Received January 04, 2005)