

## Discretization Error in Simulation of One-dimensional Reflecting Brownian Motion

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This paper is concerned with various aspects of the simulation of one-dimensional reflected (or regulated) Brownian motion. The main result shows that the discretization error associated with the Euler scheme for simulation of such a process has both a strong and weak order of convergence of precisely  $1/2$ . This contrasts with the faster order 1 achievable for simulations of SDE's without reflecting boundaries. The asymptotic distribution of the discretization error is described using Williams' decomposition of a Brownian path at the time of a minimum. Improved methods for simulation of reflected Brownian motion are discussed.