



UC3M-ICMAT Seminar – 2015/2016

Applied Probability and Statistics

Numerical Methods for Stochastic Portfolio Theory

Nawaf BOU-RABEE
Rutgers University, USA

Wednesday, November 18, 2015
11h30, *ICMAT, Aula Gris I*

In this talk I present joint work with Ioannis Karatzas wherein we develop/analyze algorithms for a class of stochastic differential equations (SDE) arising in stochastic portfolio theory. These SDEs model the evolution of a collection of stock prices and may be used to e.g. calibrate investment strategies. The SDEs are characterised by drift and covariance coefficients with simple jump discontinuities and local times at these points of discontinuity. These equations are numerically stiff because typically the lowest ranked stock has an outsized drift. Like the Tanaka equation, these SDEs typically do not have a strong solution, but do have a unique weak solution. In this context, I present numerical methods which are weakly accurate with respect to the SDE solution and stochastically stable. In order to accurately capture the jump discontinuities in the drift and covariance, we use Markov Chain Approximation Methods.

Instituto de Ciencias Matemáticas
Campus de Cantoblanco UAM
C/ Nicolás Cabrera 13-15
28049 Madrid, Spain
www.icmat.es