



UC3M-ICMAT Seminar – 2014

## Applied Probability and Statistics

### Simulation of the CIR process and the Heston model

Anke WIESE (Hariat-Watt Univ., Edinburgh, UK)

Wednesday, June 11, 2014

11h00, ICMAT, Aula Gris I

The Cox-Ingersoll-Ross (CIR) process is frequently used as a model for financial variables, most notably for the short rate of interest (Cox, Ingersoll and Ross 1985) and the variance process in the Heston stochastic volatility model (Heston 1993). The transition probability for the CIR process is known to be a scaled non-central chi-square distribution. The efficient sampling from this distribution is thus an important aspect for the application of these models. In this talk, we will derive a new representation for the central chi-square density. Based on this representation we will derive two new efficient methods for sampling from this distribution. We illustrate our methods to non-central chi-square variance sampling in the Heston model.

Instituto de Ciencias Matemáticas  
Campus de Cantoblanco UAM  
C/ Nicolás Cabrera 13-15  
28049 Madrid, Spain  
[www.icmat.es](http://www.icmat.es)