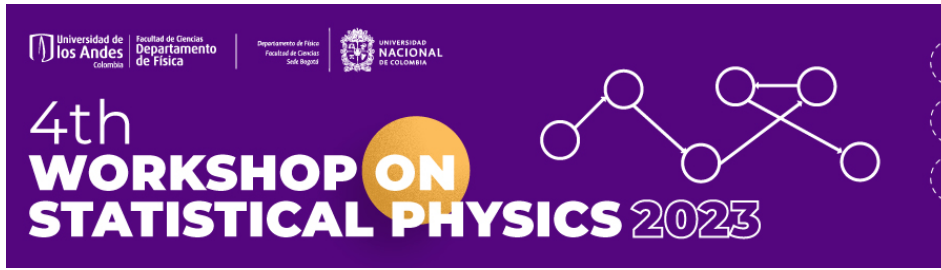


4th Workshop on Statistical Physics



Contribution ID: 21

Tipo: **Invited talk**

Numerical integration of a class of stochastic differential equations with singular coefficients

viernes, 6 de octubre de 2023 9:00 (20 minutos)

The simulation of stochastic systems is a valuable tool to investigate a broad range of topics, from atomistic simulations of colloidal systems and magnetic materials to the simulation of interest rates and derivatives in mathematical finance. In most cases, these systems are simulated by integrating the corresponding stochastic differential equations (SDEs) via the Euler-Maruyama, Milstein or Heun methods, which are known to be stable and convergent whenever the coefficient functions in the SDE satisfy certain smoothness and regularity conditions. However, several systems of interest are described by SDEs with singularities, and many of the usual integrating methods become unstable and their convergence is not guaranteed. In this talk, we explore the particular case of the Bessel process as well as new numerical schemes tailored to handle singular coefficients in SDEs.

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