1035-60-125   **Doug Vestal*** (`vestal@pstat.ucsb.edu`), **Rene Carmona** and **Jean-Pierre Fouque**.
Interacting Particle Systems for the Efficient Computation of CDO Tranche Spreads with Rare Defaults.

The fast and robust calculation of *Collateralized Debt Obligations* (CDOs) Tranche Spreads is a challenging problem. Often, the user has to rely on Monte Carlo methods for these high-dimensional problems when no explicit formulas are available. The calculation of spreads depends on being able to efficiently simulate the joint-default of many names. The computational problem is only increased if one wants to accurately calculate the spread on tranches that depend on the tail of the distribution of losses. In this paper, we consider the firm value model for pricing CDOs; that is, each firm value is driven by an SDE and default happens the first time the firm value crosses some predefined default barrier. We propose an interacting particle system to accurately calculate the distribution of the losses by using a selection and mutation algorithm. We demonstrate the efficiency of this method on a toy model for which we have explicit formulas. This method will have the advantage of not requiring the user to compute a change of measure in contrast to Importance Sampling. (Received July 25, 2007)