

Conferència

Brownian trading excursions and avalanches

Dilluns 20 de febrer de 2017

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We study a parsimonious but non-trivial model of the latent limit order book where orders get placed with a fixed displacement from a center price process, i.e., some process between best bid and best ask, and get executed whenever this center price reaches their level. This mechanism corresponds to the fundamental solution of the stochastic heat equation with multiplicative noise for the relative order volume distribution. We classify various types of trades and introduce the trading excursion process, which is a Poisson point process. This allows to derive the Laplace transforms of the times to various trading events under the corresponding intensity measure. As a main application, we study the distribution of order avalanches, i.e., a series of order executions not interrupted by more than an ε -time interval, which moreover generalizes recent results about Parisian options.

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