Quantitative Finance > Pricing of Securities

Pricing options in illiquid markets: optimal systems, symmetry reductions and exact solutions

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We study a class of nonlinear pricing models which involves the feedback effect from the dynamic hedging strategies on the price of asset introduced by Sircar and Papanicolaou. We are first to study the case of a nonlinear demand function involved in the model. Using a Lie group analysis we investigate the symmetry properties of these nonlinear diffusion equations. We provide the optimal systems of subalgebras and the complete set of non-equivalent reductions of studied PDEs to ODEs. In most cases we obtain families of exact solutions or derive particular solutions to the equations.

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