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**Yan Qiu\*** ([ccsindy@unm.edu](mailto:ccsindy@unm.edu)). *Analysis of a nonlinear Black Scholes equation*. Preliminary report.

A nonlinear modification of the Black-Scholes equation, where the volatility is assumed to be uncertain constant, leads to a PDE with nonlinearity in its highest space derivative and the nonlinear coefficient function being discontinuous. First we consider the case where the volatility is assumed to be a smooth function and present basic existence and uniqueness results. To study the discontinuity in volatility we simplify the problem to a ODE and perform convergence and perturbation analysis. Last we study numerical feature as a free boundary problem. (Received February 23, 2010)