Local Volatility Calibration in Commodity Markets

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Abstract: Trading commodity future derivatives is a key strategy for many corporations, especially those in the energy sector. However, the intrinsic features of commodity markets difficults the application of well accepted pricing techniques from equity markets. Thus, under this context, we propose one approach based on Dupire's local volatility model for pricing European vanilla options on commodity futures. We address the associated calibration problem by Tikhonov regularization and present a convergence analysis. The choice of the regularization parameter is based on the Morozov's discrepancy principle, and its related regularizing properties are also addressed. We perform some empirical tests with market as well as synthetic data in order to illustrate our theoretical results.