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Volatility extraction in information based asset pricing framework via non-linear filtering

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This study looks at the derivation of a state space model that is applied in nonlinear filtering. The model is based on the Brody, Hughson and Macrina information based asset pricing model, also known as the BHM approach or BHM model. The objective of this study is to extend the application of a filtering approach used in estimation of volatilities for the Heston model to the BHM model. The measurement and transition equations obtained in the state space model are used in the extended kalman filter to extract volatility. The option price is obtained from the BS-BHM Updated Model by incorporating information in the Black-Scholes Model. This option price is used to obtain the measurement equation while the variance process is used as the transition equation.

Keywords: Kalman filter; Extended Kalman Filter; Measurement Equation; transition Equation; State Space Model.