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Estimation of time-dependent Hurst exponents with variational smoothing and application to forecasting foreign exchange rates

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***Highlights (for review)**

Highlights:

- New method to smooth any raw time series of statistics
- Smoothing method based on variational calculus provides closed-form expressions
- Application to the estimation of time-varying Hurst exponents
- Forecasting algorithm using the estimated multifractional Brownian motion
- Application to FX market with good forecasts when $H>0.5$ and non-significant results when $H<0.5$