1107-60-301 **Michal Branicki*** (m.branicki@ed.ac.uk), Dept. of Mathematics, University of Edinburgh, JCMB 6214, The King's Buildings, Peter Guthrie Tait Road, Edinburgh, EH9 3FD, United Kingdom, and **A. J. Majda**. *Quantifying Bayesian filter performance through path-space information theory.*

I will exploit connections between the filtering problem and information theory in order to revisit the issue of filter optimality in the presence of model error in the filter prior; such a setting is commonplace when designing approximate data assimilation algorithms for high-dimensional systems with a partially observed state. The effects of model error on filter stability and accuracy in this setting are analysed through appropriate information measures which naturally extend the statistical second-order, path-wise estimates of filter performance, like the mean-square error or pattern correlation, to a probabilistic 'superensemble' setting which is not necessarily Gaussian. For simplicity I will focus on the accuracy of various imperfect Kalman filters with particular emphasis is on practically achievable filter skill which requires trade-offs between different facets of filter performance; a new information criterion is introduced in this context and discussed on simple examples. Generalisations of this approach to other filters will also be outlined. (Received January 18, 2015)