Geophysical Research Abstracts
Vol. 18, EGU2016-2547, 2016
EGU General Assembly 2016

On the equivalence of Kalman filtering and least-squares estimation

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The Kalman filter is derived directly from the least-squares estimator, and generalized to accommodate stochastic processes with time variable memory. As a result of the demonstrated algebraic equivalence of the two estimators both approaches can fully benefit from the advantages implied by their individual perspectives. In particular, it is shown how Kalman filter solutions, which can accomodate short-period parameter fluctuations through stochastic modelling, can be integrated into the normal equation formalism that is used for intra- and inter-technique combination of space geodetic data.