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On the origin and determination of variance components in a stochastic framework

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In this work, variance components originate from the mismodelling of time-variable parameters by continuous piecewise linear functions. The latter functions are determined as stochastic processes in a recursive filtering and smoothing of the data, and are rigorously interpreted as effective noise in a least-squares variance component estimation scheme. Furthermore, an approximation is suggested that simplifies the algorithm through its, then, explicit dependency on the redundancy of the observation model. Applications of the scheme to simulations of a simple system yielded estimates that were near optimal.