all filter channels are usually observed individually for tuning purposes, so here we consider $\mathbf{C}(t) \triangleq \mathbf{I}$ and $\mathbf{C}_a(t)$ defined appropriately]. One would want the filter to perform as well as it "believes" it is performing. If, due to mistuned noise parameters, the filter underestimates its own errors, it will not "look hard enough" at the measurements, with resulting filter divergence problems if the discrepancy is significant enough [12, 43, 44], as depicted in Fig. 6.20a.

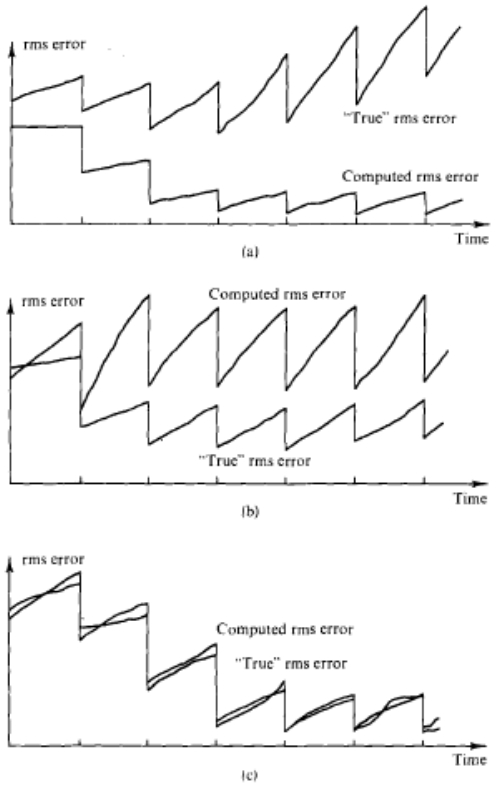

FIG. 6.20 Filter tuning through covariance analysis. (a) Filter underestimates its own errors: divergence. (b) Filter overestimates its own errors: tracking of measurement noise. (c) Well-tuned filter.

Maybeck, P.S., Stochastic Models, Estimation, and Control, Academic Press, 1979, pg. 338.