"Constraint in Attitude Estimation Part II: Unconstrained Estimation," M. D. Shuster, *The Journal of the Astronautical Sciences*, Vol. 51, No. 1, January–March 2003, pp. 75–101.

This work is the continuation of 2003a in which examples of batch attitude estimation are used to show the meaninglessness of unconstrained quaternion estimation. Estimation of an unconstrained direction-cosine matrix, however, is shown to be a useful intermediate step. Of particular concern was the unconstrained Kalman filter of Bar-Itzhack and Oshman.

Bar-Itzhack calls his unconstrained Kalman filter the AEKF (additive extended Kalman filter) and contrasts it with the MEKF (multiplicative EKF) of 1982c. That nomenclature is misleading since 1982c describes an implementation of the AEKF for the quaternion which is properly constrained. Thus it would be more correct to call the Bar-Itzhack filter the "unconstrained AEKF" so as to better distinguish it from correctly constrained AEKF's.

Superseded 1993f.

Succeeded 2003a.