1145-53-2521 **Lauren N Crider*** (lcrider@asu.edu). *Stochastic filtering on the grassmannian.* Preliminary report.

The problem of estimating a K-dimensional subspace of an N-dimensional vector space from $M > K$ noisy measurement vectors arises in numerous multi-sensor remote sensing applications, including multistatic radar and electronic surveillance. This work regards developed subspace estimators (in any context) as elements of the Grassmannian $G(K, N)$. This work further assumes the subspace of interest evolves on $G(K, N)$ in time according to a discrete-time dynamical system, i.e., the subspace at time $t + 1$ is obtained from the subspace at time t by action of an element of $\mathrm{SO}(N)$ that is comprised of a fixed, known element and a perturbation element that is distributed in a small neighborhood of the identity. At each time, an estimate of the subspace is formed from M noisy measurement vectors observed at that time. A stochastic filter that combines the estimate from data collected at time t and estimates from times $t - 1,\ t - 2, \ldots, 0$ is proposed. The performance of this proposed filter is examined as a function of the measurement noise and the noise in the system dynamics. It is shown to provide substantially better estimation accuracy at time $t > 0$ than an estimator that uses only data collected at time t. (Received September 25, 2018)