1116-VC-2740 **Tim Marrinan*** (marrinan@math.colostate.edu), **Michael Kirby**, **Chris Peterson**, **Ignacio Santamaria** and **Louis Scharf**. *Schubert variety constrained averaging on Grassmann manifolds.* Preliminary report.

Let V be an n-dimensional real vector space, and let $W_1 \subset W_2 \subset \cdots \subset W_l \subset V$ be a distinguished flag such that the dimension of $W_j = j$. Additionally suppose that the set $\{V_i\}_{i=1}^p$ is made up of p-dimensional subspaces of V that correspond to points on the associated Grassmann manifold, denoted $\mathrm{Gr}(n,p)$. We seek to find a flag, $U_1 \subset U_2 \subset \cdots \subset U_l$, where each U_j in the flag is as close as possible to the set $\{V_i\}_{i=1}^p$ with respect to a geometrically motivated cost function and with the added constraint that U_j is contained in the Schubert variety $\Omega(W_j, k_j)$ for some choice of k_j and for each j. In other words, the constraint requires that $\dim(U_j \cap W_j) \geq k_j$ for each j. We present a novel solution to the associated optimization problem and discuss applications to signal processing and pattern recognition. (Received September 22, 2015)