1086-15-2475 **Justin Dickinson Marks*** (justmarks@gmail.com), Beavercreek, OH. *Flag Mean of Generalized Grassmann Manifold Points.*

The geometrically elegant Stiefel and Grassmann manifolds have become organizational tools for data applications, such as illumination spaces for faces in digital photography. Modern data analysis involves increasingly large-scale data sets, both in terms of number of samples and number of features per sample. In circumstances such as when large-scale data has been mapped to a Stiefel or Grassmann manifold, the computation of mean representatives for clusters of points on these manifolds is a valuable tool for compression and statistical analysis.

Mean-finding algorithms which follow the theme of the Karcher mean are iterative in nature, and rely upon inversely related maps that operate between the manifold and the tangent bundle. These maps are informed by the geometric definition of the tangent bundle and the normal bundle. In this talk, we describe a method for determining a mean representative for a cluster of points on a generalized Grassmann manifold. The *Flag Mean* algorithm, which relies on the solutions of an eigenvector problem, produces a mean subspace of arbitrary dimension. We note a fascinating connection between the Flag Mean and Mutli-set Canonical Correlation Analysis, and apply the Flag Mean to digital images of faces. (Received September 25, 2012)