1046-52-586 **Paul R. Goodey** and **Wolfgang Weil*** (weil@math.uka.de), Universität Karlsruhe, 76131 Karlsruhe, Germany. *Generalized Averages of Section and Projection Functions.* Preliminary report.

A centrally symmetric star body $K \subset \mathbb{R}^d$ is known to be determined by the content of its k-dimensional central sections, $1 \leq k \leq d-1$. Groemer (1998) proved a corresponding result for arbitrary star bodies, by considering the content of half-sections. The latter gives rise to a function $s_k(K; L, v)$ on pairs (L, v), where L is a k-space and v is a unit vector in L. In 2006, we considered the average $\bar{s}_k(K; v)$ of $s_k(K; L, v)$ over all L that contain v and investigated whether the function $\bar{s}_k(K; \cdot)$ already determines K. Surprisingly, this is the case for small and large values of k, but not in general (e.g. not if $2d - 3k + 1 = 0$).

As an intermediate construction, for a fixed j-space M with $1 \leq j \leq k \leq d-1$ and $v \in M$, one may average $s_k(K; L, v)$, over all L containing M. The resulting function $\bar{s}_{jk}(K; \cdot)$ is defined on the flag manifold of pairs (M, v). Obviously, $\bar{s}_{kk}(K; \cdot) = s_k(K; \cdot)$ and $\bar{s}_{1k}(K; \cdot) = \bar{s}_k(K; \cdot)$. We show that $\bar{s}_{jk}(K; \cdot)$ determines K uniquely, for all $2 \leq j \leq k$.

Similar results for projection functions of convex bodies will also be discussed. (Received September 08, 2008)