Abstract: Let K be a convex body in $\mathbb{R}^n$. The parallel section function of K in the direction $\xi \in S^{n-1}$ is defined by

$$A_{K,\xi}(t) = \mathrm{vol}_{n-1}(K \cap \{\xi^\perp + t\xi\}), \quad t \in \mathbb{R}.$$

If K is origin-symmetric (i.e. $K = -K$), then Brunn's theorem implies

$$A_{K,\xi}(0) = \max_{t\in\mathbb{R}} A_{K,\xi}(t)$$

for all $\xi \in S^{n-1}$.
The converse statement was proved by Makai, Martini and Ódor. Namely, if $A_{K,\xi}(0) = \max_{t\in\mathbb{R}} A_{K,\xi}(t)$ for all $\xi \in S^{n-1}$, then K is origin-symmetric. We provide a stability version of this result. If $A_{K,\xi}(0)$ is close to $\max_{t\in\mathbb{R}} A_{K,\xi}(t)$ for all $\xi \in S^{n-1}$, then K is close to $-K$. Joint work with Matthew Stephen.