

Extremal sections and local optimization

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We will demonstrate how to apply local optimization methods in order to find, or, at least characterize, maximal or minimal central sections of convex bodies. We are mainly interested in the special cases when the convex body is the d -dimensional cube, or the d -dimensional regular simplex. Maximal sections of the former were determined by K. Ball in 1986, while monotonicity of the volume of diagonal central sections for $d \geq 3$ was proven by F. Bartha, F. Fodor and B. González Merino in 2021. On the other hand, finding minimal central sections of the regular simplex is still an open question. Among other results, we provide a geometric characterization for central sections of locally maximal volume of the d -dimensional cube.