Gastvortrag

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On the tendency to convexity of Minkowski sums

Abstract. For a compact subset A of $\mathbb{R}^d$, let $A(k)$ be the Minkowski sum of k copies of A, scaled by $1/k$. By a 1969 theorem of Emerson, Folkmann, Greenleaf, Shapley and Starr, $A(k)$ approaches the convex hull of A in Hausdorff distance as k goes to infinity; this fact has important applications in a number of areas including mathematical economics. A few years ago, the speaker conjectured that the volume of $A(k)$ is non-decreasing in k, or in other words, that when the volume deficit between the convex hull of A and $A(k)$ goes to 0, it actually does so monotonically. While this conjecture holds true in dimension 1 (as independently observed by F. Barthe), we show that it fails in dimension 12 or greater. Then we consider whether one can have monotonicity of convergence of when non-convexity is measured in alternate ways. Our main positive result is that Schneider's index of non-convexity of $A(k)$ converges monotonically to 0 as k increases; even the convergence does not seem to have been known before. As a by-product, we also obtain optimal rates of convergence. We also obtain analogous results for the Hausdorff distance to the convex hull, as well as for the inner radius. Joint work with Matthieu Fradelizi (Marne-la-Vallée), Arnaud Marsiglietti (CalTech), and Artem Zvavitch (Kent State).

Zeit: Dienstag, den 20. Juni 2017 um 16:15 Uhr

Ort: Bauingenieurgebäude, Technikerstraße 13, HSB 8

Gäste sind herzlich willkommen!

Eva Kopecká