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Dimensionality and the stability of the Brunn-Minkowski inequality

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Abstract. We prove stability estimates for the Brunn-Minkowski inequality for convex sets. As opposed to previous stability results, our estimates improve as the dimension grows. In particular, we obtain a non-trivial conclusion for high dimensions already when

$$\mathrm{Vol}_n\left(\frac{K+T}{2}\right) \leq 5\sqrt{\mathrm{Vol}_n(K)\,\mathrm{Vol}_n(T)}.$$

Our results are equivalent to a *thin shell* bound, which is one of the central ingredients in the proof of the central limit theorem for convex sets.