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More bounds on the diameters of convex polytopes

Let $\Delta(d,n)$ be the maximum possible edge diameter over all d-dimensional polytopes defined by n inequalities. The Hirsch conjecture, formulated in 1957, suggests that $\Delta(d,n)$ is no greater than $n-d$. No polynomial bound is currently known for $\Delta(d,n)$, the best one being quasi-polynomial due to Kalai and Kleitman in 1992. Goodey showed in 1972 that $\Delta(4,10)=5$ and $\Delta(5,11)=6$, and more recently, Bremner and Schewe showed $\Delta(4,11)=\Delta(6,12)=6$. In this follow-up, we show that $\Delta(4,12)=7$ and present strong evidence that $\Delta(5,12)=\Delta(6,13)=7$.

Joint work with David Bremner, Antoine Deza and Lars Schewe.