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Sherry Sarkar, Alexander Xue and Pablo Soberón*

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Bernard Baruch Way, New York, NY 10010. *Matroids, Helly's theorem, and ellipsoids.*

We discuss various generalizations of Helly's theorem for convex sets. In particular, we are interested in conditions that imply that the intersection of a family of convex sets in R^d has large volume or large diameter. We prove exact volumetric or diameter Helly-type theorems if the volume or diameter is witnessed by a low-complexity set, such as an ellipsoid or a zonotope. This work was part of the 2019 CUNY combinatorics REU. (Received September 09, 2019)