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0/1-Borsuk problem on matroids

The Borsuk partition problem or better known as the Borsuk Conjecture asks whether for all $S \subset \mathbb{R}^n$ with diameter d, there is a partition of S in at most $n+1$ subsets such that the diameter of each subset is less than d.

In 1993, the conjecture was proved false by J. Kahn and G. Kalai, with an astonishing finite conterexample, furthermore, the given set was made only by canonical vectors with the same weight. The Borsuk problem restricted to this type of sets is known today as the 0/1-Borsuk problem.

In this talk, we are going to analyze this counterexample and the 0/1-Borsuk problem when the set is the set of vertices of a matroid basis polytope.