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**Alessio Figalli\*** ([figalli@math.utexas.edu](mailto:figalli@math.utexas.edu)). *Stability results for the semisum of sets in  $R^n$ .*

Given a Borel  $A$  in  $R^n$  of positive measure, one can consider its semisum  $S=(A+A)/2$ . It is clear that  $S$  contains  $A$ , and it is not difficult to prove that they have the same measure if and only if  $A$  is equal to his convex hull minus a set of measure zero. We now wonder whether this statement is stable: if the measure of  $S$  is close to the one of  $A$ , is  $A$  close to his convex hull? More generally, one may consider the semisum of two different sets  $A$  and  $B$ , in which case our question corresponds to proving a stability result for the Brunn-Minkowski inequality. When  $n=1$ , one can approximate a set with finite unions of intervals to translate the problem to the integers  $Z$ . In this discrete setting the question becomes a well-studied problem in additive combinatorics, usually known as Freiman's Theorem. In this talk, which is intended for a general audience, I will review some results in the one-dimensional discrete setting and describe how to answer to the problem in arbitrary dimension. (Received February 04, 2014)