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*A generalization of the inverse theorem for uniformity norms*

The uniformity norms, introduced by Gowers, are very useful tools in additive combinatorics. A central result regarding these norms is the inverse theorem, proved for functions on finite cyclic groups by Green, Tao and Ziegler, which states essentially that such a function has large uniformity norm of order  $k+1$  only if the function correlates with a nilsequence of step  $k$ . I shall discuss recent joint work with Balázs Szegedy in which we obtain a generalization of the Green-Tao-Ziegler inverse theorem, extending it to a class of objects including all compact abelian groups and also more general objects such as nilmanifolds.