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*Structure of large spectra: problems and constructions*

Given a subset of a finite abelian group, its large spectrum is the set of Fourier coefficients which are unusually large in absolute value. Obtaining a deeper understanding of such sets, in particular how much additive structure they must have, has been at the heart of many of the advances in additive combinatorics in recent years.

For example, in recent joint work with Olof Sisask, building upon ideas of Bateman and Katz, we proved a particularly strong structural result about certain kinds of large spectrum, which allowed us to obtain new bounds for sets without three-term arithmetic progressions.

In this talk I will give a survey of our current understanding of such sets, what they can look like, and will highlight some of the gaps in our knowledge, in particular some conjectures that, if solved, should yield further progress on the bounds for sets without three-term arithmetic progressions.