

Multiparameter Fourier Analysis: Singular integrals, commutators, and bilinear operators

Jill Pipher

Abstract

Multiparameter Fourier analysis extends the classical one parameter theory of operators to higher dimensions in a variety of ways which fully exploit an n -dimensional geometry. The objects of study include: singular integrals which arise in the study of pointwise convergence of multiple Fourier series, their associated Hardy and BMO spaces, commutators of such singular integrals with BMO functions, multiparameter bilinear operators which generalize a tensor product of bilinear operators, and maximal operators (and their associated covering lemmas) which arise, for example, in the study of limits at the boundary of functions analytic in the polydisk. We survey a collection of recent results and describe some of the important analytic tools in this area.