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Dmitriy Bilyk* (dbilyk@math.umn.edu). *Simultaneous Diophantine approximations and lacunary Fourier series.*

We consider the following one-dimensional problem: given a set Ω on the real line, find a point α such that all the differences $\alpha - \theta$, $\theta \in \Omega$, are badly approximable by rationals. How do the arising Diophantine estimates depend on the geometry of the set Ω ? We provide several measure-theoretic approaches to this question which yield different results depending on the entropy properties of Ω . Besides our original motivation for this question, which comes from geometric discrepancy theory, the problem, as well as methods, exhibit connections to some questions in Fourier analysis and combinatorics, e.g. chromatic numbers and the behavior of lacunary Fourier series. This is joint work with X. Ma, J. Pipher, C. Spencer. (Received February 11, 2014)