A Note on the Linear Independence of Characteristic Functions of Self-Similar Sets

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Abstract

Specific self-similar sets in $I\!R^n$ can be obtained by the action of an expanding integer scaling matrix. These sets have certain applications in wavelet analysis. In this paper, we give necessary and sufficient conditions for the linear independence of the translates of the characteristic functions associated with these sets. Furthermore, we show that for specific scaling matrices these conditions can be checked directly from the representers of certain equivalence classes induced by the scaling matrix.

Key Words: Self–similar sets, linear independence, stability, refinable functions, expanding scaling matrices.

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