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A fractal set constructed from the class of wavelet sets. Preliminary report.

Dai and Larson proved the existence of single dyadic orthonormal wavelets in Euclidean space. A general construction of such wavelets due to Manuel Leon and the first named author produces a large class of wavelet sets, i.e., sets whose characteristic functions are the Fourier transforms of wavelets. This construction is reformulated in terms of an iterative procedure, giving rise to a notion of self-similarity and to limit sets in Euclidean space associated with a given wavelet set. These limit sets are evaluated, and the Hausdorff dimension of their union, over the class of all wavelet sets, is computed. It remains to use the theory of frames to implement the aforementioned iterative procedure for application to image analysis. (Received September 13, 2000)