Wavelet Sets in $\mathbf{R}^2$

Bill Finkenkeller, Texas A&M University
Chelsea Kaihoi, Iowa State University

A subset E of $\mathbf{R}$ is a wavelet set if and only if $\{E+2\pi*n|$ n an integer$\}$ is a measurable partition of $\mathbf{R}$ and $\{2^{\wedge}(n)E|$ n an integer$\}$ is a 2-dilation "tiler" of $\mathbf{R}$ (modulo Lebesgue null sets). This can be generalized to $\mathbf{R}^2$ (using the matrix 2I as the dilation factor and $2\pi(l,m)$, where l and m are integers, for the translation component). We will show a few examples of connected wavelet sets in $\mathbf{R}^2$ as well as explore the existence of wavelet sets in $\mathbf{R}^2$ which are composed of a finite number of rectangles.