1035-42-1413 **Jeffrey D. Blanchard*** (jeff@math.utah.edu), 155 South 1400 East, Room 233, Salt Lake City, UT 84112-0090. *Minimally supported frequency composite dilation wavelets.* Preliminary report.

A composite dilation wavelet is a collection of functions generating an orthonormal basis for $L^2(\mathbf{R^n})$ under the actions of translations from a full rank lattice and dilations by products of elements of non-commuting groups A and B. A minimally supported frequency composite dilation wavelet has generating functions whose Fourier transforms are characteristic functions of dual-lattice tiling sets. We study the case where the group A is the group of integer powers of some expanding matrix while the group B is a finite subgroup of the invertible $n \times n$ matrices. We first establish conditions on A, B, and a full rank lattice that are sufficient to guarantee the existence of a multiresolution analysis, minimally supported frequency, composite dilation wavelet for $L^2(\mathbf{R^n})$. We then show that when the group B has an appropriate fundamental region, then B and an arbitrary full rank lattice can generate a minimally supported frequency composite dilation wavelet. We conclude by demonstrating the ability to find such minimally supported frequency composite dilation wavelets with a single generator. (Received September 19, 2007)