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1003-43-1105 **Eva Curry*** (ecurry@mathstat.dal.ca), Department of Mathematics and Statistics, Chase Building, Dalhousie University, Halifax, NS B3H 3J5, Canada. *Radix representations of \mathbb{Z}^n , low-pass filters, and existence of multivariable wavelets.*

We consider multivariable MRA wavelets as described by Gröchenig and Madych (1992), who showed that the characteristic function of a set Q is a scaling function for a multiresolution analysis associated with a dilation matrix A only if the set Q generates a self-affine tiling of \mathbb{R}^n under dilation by A . A number of authors have considered the question of which dilation matrices admit self-affine tiling sets, and thus Haar-like scaling functions, including Strichartz (1993) and Lagarias and Wang (in a series of papers circa 1996). A sufficient condition for a dilation matrix A to generate a self-affine tiling set is that all vectors in \mathbb{Z}^n have a radix representation with base A . We define what we mean by radix representations for vectors, and show that all dilation matrices with sufficiently large singular values yield a radix representation of \mathbb{Z}^n . This approach allows us to show the existence of multivariable wavelets for arbitrary dilation matrices. (Received October 04, 2004)