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**Mark McClure\*** (mcmcc1ur@unca.edu), Department of Mathematics, University of North Carolina at Asheville, Asheville, NC 28804. *Eigenvectors of recursively defined matrices and self-similar measures.*

Suppose we defined a sequence of matrices using a recursive block construction so that the dimension of the matrices grows exponentially. It is not unusual for the sequence to have a natural self-similar limit structure. Now suppose we investigate the sequence of dominant eigenvectors associated with these matrices. It turns out that the limit of these vectors may frequently be interpreted as a fractal measure. In particular, we outline conditions which are sufficient to guarantee that the limit is a self-similar measure. The most basic examples are elementary enough for an undergraduate math major to follow, yet minor variations leading to challenging open questions. Furthermore these types of recurrences arise naturally in enumerative combinatorics. (Received September 22, 2006)