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Juan R. Romero* (jrr@math.uh.edu), University of Houston, Department of Mathematics, 651 PGH, Houston, TX 77204-3008, and **Manos Papadakis**. *Non-separable Frame Multiresolution Analysis and Fast Wavelet Algorithms in Multidimensions*. Preliminary report.

We extend some of the classical results of the theory of frame multiresolution analysis in multidimensions. We focus on non-separable such structures generated by a finite number of frame scaling functions. We use these frame MRAs to derive Fast Wavelet algorithms. The derivation of these algorithms allows us to obtain a certain generalization of the Unitary Extension Principle for filters corresponding to semi-orthogonal frame wavelets associated with a frame multiresolution analysis. (Received September 28, 2005)