1078-46-268   **Youngmi Hur** and **Amos Ron*** (`amos@cs.wisc.edu`), CS Department, 1210 West Dayton, Madison, WI 53706. *High-performance very local Riesz wavelet bases of $L_2(R^d)$.*

We introduce new methodologies for the construction of high-performance very local Riesz wavelet bases of $L_2(R^d)$ in arbitrarily high spatial dimension d. The localness L of the representation is measured as the sum of the volumes of the supports of the underlying mother wavelets; small localness number is one of the sought-for properties in wavelet constructions. Our constructs are very simple and they are based on the framelet construction methods known as the CAMP scheme and the L-CAMP scheme. Within our general methodology, the subclass of piecewise-constant constructions is the most local one. It includes Riesz wavelet bases with any performance grade and in any spatial dimension. In this subclass, the Riesz wavelet basis with Jackson-type performance k (namely, with k vanishing moments) has localness score $L < k + 1$, independently of the spatial dimension d. Thus, while the number of mother wavelets grows exponentially fast with the dimension, the sum of their volumes remains bounded. In comparison, the widely used d-dimensional tensor-product Daubechies' system with k vanishing moments has localness score $L \approx (4k-2)^d$. (Received December 11, 2011)

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