

1154-22-1165

Judith A. Packer* (packer@colorado.edu), Department of Mathematics, CB 395, University of Colorado, Boulder, Boulder, CO 80309-0395. *Direct integral decompositions of wavelet representations for crystallographic groups*. Preliminary report.

We study certain types of wavelets associated to crystallographic groups that generalize conventional wavelets in the two-dimensional plane. In this set-up, the group of integer translations is replaced by action by a fixed wallpaper symmetry group, and we choose our dilation matrix to be an odd integer times the identity, for some odd integer greater than or equal to 3. We use the wavelet sets for crystallographic groups constructed by K. Merrill. These sets allow us to decompose the unitary representation of the associated discrete semidirect product generated by the crystallographic group and the dilation matrix into irreducible components, thus generalizing results of L.-H. Lim, J. Packer, and K. Taylor from 2001. The wavelet representations of the discrete semidirect product groups are related to their regular representations by studying the associated group C^* -algebras. This work is joint with L. Baggett, K. Merrill, and K. Taylor. (Received September 13, 2019)