

***s*-ELEMENTARY SUPER WAVELETS AND SUPER FRAME WAVELETS**

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This paper presents a characterization of *s*-elementary super wavelets and super frame wavelets in $\bigoplus_n L^2(\mathbb{R})$, also some examples are constructed. Furthermore, it provides a characterization of *s*-elementary super wavelets and super frame wavelets for an $n \times n$ expansive matrix A in $\bigoplus_n L^2(\mathbb{R}^n)$.

1. Introduction

The concept of super wavelets was introduced by Han and Larson in [1] and gave characterization for all super wavelets in $\bigoplus_n L^2(\mathbb{R}) := L^2(\mathbb{R}) \oplus L^2(\mathbb{R}) \oplus \cdots \oplus L^2(\mathbb{R})$. Concept of wavelets is generalized to more general space like local field of positive characteristic [2]. The characterization of all super wavelets is given in [3]. Due to the success of frame wavelets, several authors have studied the concept of super frame wavelets in [1], [7], [8]. In [1], Han and Larson demonstrated that super wavelets in the superspace $L^2(\mathbb{R}) \oplus L^2(\mathbb{R})$ do not possess a multiresolution analysis (MRA) structure, similar to the behavior of MRA wavelets in $L^2(\mathbb{R})$. However, in [5] construction of MRA within the space $\bigoplus_n L^2(\mathbb{R})$ was achieved by introducing modifications to the dilation and translation processes. Han and Larson later provided a simpler definition of MRA for $L^2(\mathbb{R}) \oplus L^2(\mathbb{R})$ in [1], where a pair (ψ_1, ψ_2) is defined as an MRA super wavelet if each of ψ_1 and ψ_2 is a frame multiresolution analysis (FMRA) wavelet in $L^2(\mathbb{R})$. Subsequently, Bildea et al., in [5] refined this approach

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