

QUASI-INTERPOLATORY REFINABLE FUNCTIONS AND CONSTRUCTION OF BIORTHOGONAL WAVELET SYSTEMS

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ABSTRACT

We present a new family of compactly supported and symmetric biorthogonal wavelet systems, which extend and unify the Biorthogonal Coifman wavelet system. The refinement mask has a tension parameter ω . When $\omega = 0$, it becomes the the Biorthogonal Coifman wavelet system. However, choosing ω away from zero, we can get better smoothness of the refinable functions at the expense of slightly larger support. Though the construction of our biorthogonal wavelet system starts from a new class of quasi-interpolatory subdivision schemes, but we find that the refinement masks accidentally coincides with the ones by Daubechies et. al. in [3, §6.C], which are designed for the purpose of generating biorthogonal wavelets close to orthonormal cases. However, the corresponding mathematical analysis is yet to be provided. Therefore, the aim of this study is to highlight the connection between the quasi-interpolatory subdivision schemes and the masks by Daubechies et. al, and then to study the fundamental properties of the new biorthogonal wavelet systems such as regularity, stability, linear independence, vanishing moments and accuracy.

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