ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

15. Numerical Analysis and Scientific Computing

1991 MS Classification: 42, 65

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Polynomial wavelets

Starting from orthogonal polynomials we summarize how to find translation invariant bases and how one can construct corresponding wavelets.
For general orthogonal polynomials we consider Christoffel-Darboux-kernels and some smoothed versions of it. By taking suitable differences of these kernels we obtain the wavelets. Depending on the smoothness parameter we compute Riesz and frame bounds. Furthermore, for the Jacobi polynomial setting we study how these frame coefficients can be used to detect singularities of given functions. In particular, for truncated power functions exact asymptotic bounds for the decay of the frame coefficients are presented. Part of these results is joint work with B. Fischer and H. N. Mhaskar.