Chebyshev Wavelets and Applications

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Abstract : In this paper we deal with Chebyshev wavelets. We analyze their properties computing their Fourier transform. Moreover, we discuss the differential properties of Chebyshev wavelets due the connection coefficients. The differential properties of Chebyshev wavelets, expressed by the connection coefficients (also called refinable integrals), are given by finite series in terms of the Kronecker delta. Moreover, we treat the p-order derivative of Chebyshev wavelets and compute its Fourier transform. Finally, we expand the mother wavelet in Taylor series with an application both in fractional calculus and fractal geometry.
Keywords : Chebyshev wavelets, Fourier transform, connection coefficients, Taylor series, local fractional derivative, Cantor set