APPLICATIONS OF POLYSPLINE WAVELETS TO ASTRONOMICAL IMAGE ANALYSIS

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Recently in Image Processing there have been invented a lot of approaches for analyzing, compression, presentation, and denoising based on the methods of Wavelet Analysis. The wavelets are based on a concept different from the usual Fourier analysis since they use as a set of fundamental functions not the functions derived from the exponential function (as sin, cos, exp), but other functions, which have their support localized in space (compactly supported, according to the mathematical terminology). Let us remark that the functions derived from the exponential function do not have localized support, but they are non-zero in the whole space. For the last reason they are not very convenient for expansion of signals and images which do not decay at infinity.

Recently, a new approach has been developed in multivariate Wavelet Analysis which is based on the new notion of spline – the so-called polysplines, [1]. It is a genuine generalization to the one-dimensional approach of Chui, who has used polynomial splines to construct wavelets with compact support, see [2,3].

We provide experimental results of the application of the newly developed polyspline wavelets to several astronomical images obtained from wide-field plate plates.
We use a specific polyspline-based framework and compare it to the traditional 2D wavelet methods.

References

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