Wavelet-related techniques have proven useful in the processing and analysis of one and two dimensional data sets (spectra in the former case, images in the latter). In this work we apply pseudo-filters, introduced in a previous work (Sanz et al. 2001), to optimize the detection and extraction of point sources from a one-dimensional array of time-ordered data such as the one that will produce the future ESA Planck mission, devoted to the study of the Cosmic Background Radiation. One of the most thrilling challenges in the study of the Cosmic Microwave Background (CMB) is to deal with the problem of separating the cosmological signal from the different foregrounds and noises that appear in CMB experiments in order to provide both constraints on the fundamental cosmological parameters and information on the nature and distribution of the different foregrounds. Among the different foregrounds, point sources are particularly difficult to extract due to the numerous uncertainties still remaining in their distribution and spectral properties.

By filtering an amplification effect (gain) is expected when going to pseudo-filter space. We have filtered a simulated Planck time ordered data set with the optimal pseudo-filter (Herranz et al. 2001) and compared the results with the ones obtained by filtering with a Gaussian filter and a Mexican Hat Wavelet of width equal to the scale of the sources. Above a 5σ detection threshold the optimal pseudo-filter and the Mexican Hat Wavelet give a similar number of detections, but the number of spurious detections is 10 times higher for the Mexican Hat. The Gaussian filter gives a much lower number of detections and a much higher number of spurious ones. We conclude that optimal pseudo-filters are well suited to detect and extract sources with a given profile embedded in a background of known statistical properties.

References