THE MEXICAN HAT WAVELET FAMILY. APPLICATION TO POINT SOURCE DETECTION IN COSMIC MICROWAVE BACKGROUND (ThuPmOR10)

Author(s) :

Francisco Argüeso	(Universidad de Oviedo, Spain)
Joaquin Gonzalez−Nuevo	(Universidad de Oviedo, Spain)
Jose Luis Sanz	(Instituto de Fisica de Cantabria, Spain)
L. Toffolatti	(Universidad de Oviedo, Spain)
P. Vielva	(College de France, France)
Diego Herranz	(Instituto de Fisica de Cantabria, Spain)
Marcos Lopez−Caniego	(Instituto de Fisica de Cantabria, Spain)

Abstract :

We propose a detection technique in 2D images based on an isotropic wavelet family. This family is naturally constructed as an extension of the Gaussian−Mexican Hat Wavelet pair and for that reason we call it the Mexican Hat Wavelet Family (MHWF). We show the performance of these wavelets for dealing with the detection of point extragalactic sources in cosmic microwave background (CMB) maps: a very important issue within the most general problem of the component separation of the microwave sky. In particular, simulations for one channel (44 GHz) of the forthcoming Planck mission have been analysed. We present the results and compare them with those obtained using the Mexican Hat Wavelet technique (MHW), which has been proven a suitable tool for detecting point sources. The MHWF provides a point source catalogue at 44 GHz of 690 sources. Under the same conditions, the MHW provides 604 sources.

Menu