Point source extraction from the Herschel timeline

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An extraordinary feature exhibited by the Herschel maps of star forming complexes is the ubiquitous pattern of filaments in the ISM structure. The diffuse background of dust thermal emission is extremely rich in intense and highly structured extended emission, which shows a widespread organization of filaments at a broad range of surface brightness levels. Morphological analysis of these fields is usually based on a variety of methods, which are common in a sense that they aim to interpret the shape of the image power spectrum (e.g. delta -variance, multifractals). Unbiased analysis, however, remain difficult because of the presence of clustered YSOs, protostars and dense clumps in SFRs. These objects contribute to the image power spectra with a significant power at a broad range of spatial frequencies: (1) compact sources modify the image properties at frequencies comparable to the beam-size; and (2) depending on the surface density and clustering strength, lower spatial frequencies are biased with a smaller power density but typically at large bandwidth.

The 'boloSource' algorithm has been developed to subtract point- and compact sources from the diffuse background of large-scale Galactic maps observed by PACS and SPIRE photometers. This novel algorithm can produce suitable products for analysis of extended-emission and filamentary structures but it could also provide an alternative way of source photometry in highly confused regions. Preliminary tests confirmed the task can efficiently mitigate reconstruction artifacts of inversion mapping algorithms by filtering out bright sources or sharp features from the detector timeline.

All software components have been developed in Jython, the package will be made available in HIPE v10+.