

Space activities at Konkoly Observatory in 2003

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In the framework of our long-term participation in ESA's post-mission activities related to the *Infrared Space Observatory* we have produced photometric catalogues for the ISO Data Archive. The observations were processed in special - often interactive - ways in order to achieve data quality superseding that of the automatic products stored as default in the Archive. Our "Highly Processed Data Products (HPDPs)" have successfully passed ESA's quality control and are available for research on the ISO web site. Some of our software tools developed for the processing are already in use at the ISO Data Centre. We plan to re-process a considerable fraction of all observations obtained with the infrared photometer of ISO. The HPDPs also include carefully defined quality flags per measurement for direct connection to the virtual observatories.

On the basis of space observations obtained with the *Infrared Space Observatory* we analysed the post-outburst behaviour of 7 FU Orionis-type young stars. These objects, in which the unusually high mass accretion rate leads to an sudden brightening of 100 times, form an important class of solar mass young stars, because the process of accretion can be studied with almost laboratory clarity. We compared the ISO observations obtained in 1997 with earlier infrared measurement of the IRAS satellite in 1983, and found that at near- and mid-infrared wavelengths 4 of the 7 objects became fainter during the 15 years period, in accordance with our present paradigm of the FU Orionis phenomenon. In the far-infrared, however, no fading was detected, in contradiction with the predictions. The reason is unclear, and may indicate that either the geometry of the circumstellar environment or the heating source of the circumstellar dust is different from assumptions of the present models.

We analysed far-infrared maps of galactic cirrus clouds in order to characterize their small scale spatial structure. The observations have been performed with the *Infrared Space Observatory*. Our results revealed that the slope of the Fourier-spectrum derived from the clouds' brightness maps (this slope is directly connected to the fractal dimension of the cloud) varies among different lines of sights. Traditionally the slope value was believed to be a „universal constant” on the basis of IRAS observations. Our findings will make possible to separate the fluctuations of galactic and extragalactic origin, and then to determine the amplitude of the fluctuations of the extragalactic infrared sky background. In a related project, carried out in collaboration with ESA astronomers, we determined the far-infrared colours of a sample of cirrus clouds, again using ISO data. Our main result is that in these not-too-dense clouds the emissivity of dust grains in the far-infrared significantly exceeds the usual value representative of the diffuse interstellar medium. The origin of the anomalous emissivity could be the evolution of single dust particles into grain clusters with volume filling factor far below unity. The result, via the more precise subtraction of the cirrus contribution, will help to determine the absolute value of the infrared extragalactic background.