IAF SYMPOSIUM ON INTEGRATED APPLICATIONS (B5)
Tools and Technology in Support of Integrated Applications (1)

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PLANCK ADDED VALUE INTERFACES

Abstract

The Planck spacecraft was a cosmology mission operated by ESA from 2009 to 2013. Planck was a space observatory detecting photon intensity and polarisation that conducted surveys with the goal being to observe anisotropies (properties changing when viewed from different directions) in the cosmic microwave background. While the Planck operational mission has ended, the process of performing science on the data is still in its early phases and is expected to continue for many years to come. The Planck Legacy Archive (PLA) hosted at ESAC is the data archiving system, containing all public products currently available from the mission. As Planck data audience became wider, the need arose for a Planck Added Value Interfaces (PLAAVI) system to facilitate the further use of the PLA contents. The main objective of PLAAVI was to develop a system, and make it available to the users as an extension to the existing PLA. The intention of PLAAVI is to allow users to apply various post-processing to PLA data before downloading them. The provided functionality also allows users to reprocess the science data in a manner different from what is done by the Planck data processing centers and thereby generate their own products.

In the scope of the PLAAVI project, awarded by ESA in 2015 to Planetek Hellas (prime), Expert Analytics-XAL (subcontractor) and University of Oslo in an advisory role, the following added value interfaces have been developed: **1. Synchronous operations on map cut-outs**: 1.1 Component subtraction, unit conversion, colour **2. Asynchronous operations, submitted in a queue with execution and later, results delivery**: 2.1 Full maps operations providing: component subtraction, unit conversion, colour correction, masking, bandpass leakage correction. 2.2 Map making, including ring based map making and baseline-removed pixel averaging map making. 2.3 Component separation, including ILC component separation and parametric model maximum likelihood component separation 2.4 Implementation of a graphical user interface for the Planck Sky Model tool and execution on ESAC's grid-based computing system 2.5 Effective beam averaging

Major achievements accomplished during this project include: - Tight integration with the existing PLA website - Development of a graphical interface to Planck Sky Map tool, a strictly command based only tool, and integration with ESAC's computing grid environment - Validation and verification of provided algorithms through an continuous interactive development environment - Zero-downtime system expandability to dynamically respond to planned needs for additional computing capacity