

Letter to NASA in Regard to Planck Data Analysis Activities  
Submitted by the IPSIG

NASA's investments in the Planck mission have been enormously successful. Results published to date have already had a significant impact in cosmology and other areas of astrophysics. The scientific community eagerly awaits the second data release planned for November 2014, which may shed light on the physics of the big bang. The third and final data release is planned for December 2015; it is scheduled to include the final processing of the data by the Planck team. The data from Planck are critically important to the CMB community, and will set the foundation for scientific work for the next decade, including the basis for planning a future polarization mission, the Inflation Probe. The full and complete processing of the Planck data is thus vital.

We are writing to highlight aspects of the data analysis work that may be relevant for near term decisions about the final products forthcoming from the mission.

The quality of the final archived data depends on its absolute calibration and the level of residual systematic uncertainties. Properly calibrating the instrument and assessing systematic errors must be done by the experiment's team itself because it requires integrated knowledge of the instrument and its hardware response, including identifying features of the hardware response in the raw time streams. Once the instrument team is disbanded, it will be exceedingly difficult, and in practice impossible, to assemble the same level of knowledge of the instrument and data.

The Planck US team is currently leading certain aspects of the absolute calibration work and of identifying systematic uncertainties. The US team is also the only team able to perform all of the simulations needed for validation and verification of data debiasing approaches, and for quantifying the uncertainties associated with this debiasing. It is the only team working with the data from both the High and the Low Frequency Instruments.

This is an expertise that has been accumulated over the lifetime of the project and that would be difficult to replace and still maintain the timetable for releasing data products. Therefore a loss of this expertise would likely translate to a reduction in the quality of the final data products.

To date the Planck CMB analysis schedule has been fast and therefore extremely efficient. With its data set spanning 9 frequency bands, multiple angular resolutions, and trillion time domain samples, it presents the greatest data analysis challenge of any CMB experiment to date.

To guarantee the long term impact of Planck we urge NASA to ensure that the archived data has the highest level of fidelity that the experimental team can provide.