

Calibration and Standardization of Large Surveys and Missions in Astronomy and Astrophysics



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Calibration of the Far-infrared and Sub-millimetre Instruments of the Herschel Space Observatory

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The Herschel Space Observatory has the largest aperture of any space telescope, with a primary mirror of 3.5 metres in diameter. The telescope is radiatively cooled to below 90K, allowing it to be used for far-infrared and sub-millimetre observation. It has three cryogenically cooled focal plane instruments that cover the wavelength range of 55 to 670 microns. These allow broad-band photometry at 6 wavelengths at 70, 100, 160, 250, 350 and 500 microns using two types of bolometers as well as spectroscopic capabilities at various resolutions up to $\sim 10^7$ using grating, FTS and heterodyne (AOS and autocorrelation) spectrometers. The observatory provides a centralized coordination of calibration and cross-calibration for all instrument modes through a steering group. In this presentation we concentrate on the calibrators and the modeling of calibrators used for the flux calibration of the photometers and instrument cross-calibration. The linearity and stability of the bolometer responses enables very accurate and repeatable photometry. Further improvements are discussed and examples of the science capabilities and results provided.

Summary

Overview of the overall calibration and performance of the far-infrared instruments on the Herschel Space Observatory.

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