The ISOLWS-IRAS Cross-Calibration of Extragalactic Sources

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We present a detailed analysis and comparison of the ISOLWS and IRAS 60μm and 100μm continuum fluxes for a sample of galaxies. This sample consists of most of the extragalactic observations taken with the LWS in the L01 and L02 AOTs and is unique since the data were reduced in a uniform manner using all of the advanced data reduction tools (LIA, ISAP). The galaxies used for this comparison were constrained to those whose far-infrared (FIR) emission fell within the 75" LWS beam. There were 150 galaxies used for this analysis with 60μm fluxes ranging from <1 Jy to 300 Jy.

The effects of pipeline (OLP) version, AOT type, and the IRAS and ISO filter shapes are considered as part of our comparison. The galaxies that were observed in the full grating L01 AOT are compared between the LIA and OLP reductions. For galaxies with identical and overlapping pointings in the L01 and L02 AOTs, the 60μm LWS flux differences between AOTs is examined.

Systematic discrepancies in the ISOLWS and IRAS 60μm and 100μm fluxes are determined as a function of source strength. The ISO fluxes are (1)systematically higher than the IRAS fluxes by 10% between 1-300 Jy and (2)significantly higher (>20%) at flux levels <10 Jy and >80 Jy. Effects due to pipeline version and AOT type are ruled out as the source of these differences. A background component removed from the IRAS data is considered and largely eliminated also. Calibration differences between the ISO and IRAS observatories may likely be the cause of these discrepancies and is discussed here.