

Far Infrared Extragalactic Background Radiation: Source Counts with ISOPHOT

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Abstract. We have searched for point-like sources in eight fields mapped at two or three wavelengths between 90 μm and 180 μm with the ISOPHOT instrument aboard the ISO satellite. Most of the 55 sources detected are suspected to be extragalactic and cannot be associated with previously known objects. It is probable, also from the far-infrared (FIR) spectral energy distributions, that dust-enshrouded, distant galaxies form a significant fraction of the sources.

We present a tentative list of the detected extragalactic FIR-sources. Based on the analyzed data we estimate the number density of extragalactic sources at wavelengths 90 μm , 150 μm and 180 μm and at flux density levels down to 100 mJy to be $1 \times 10^5 \text{ sr}^{-1}$, $2 \times 10^5 \text{ sr}^{-1}$, and $3 \times 10^5 \text{ sr}^{-1}$, respectively.

Models of strong galaxy evolution are in best agreement with our results, although the number of detections exceeds predictions of most models. No-evolution models can be rejected at a high confidence level. Comparison with COBE results indicates that at 90 μm the detected sources correspond to >20% of the extragalactic background light. At longer wavelengths the corresponding fraction is $\sim 10\%$.