Probing the Confusion limits in the Far-Infrared

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We investigate the confusion limits in far-infrared due to both Galactic cirrus and the superposition of extragalactic point sources for the upcoming space mission ASTRO-F. For this purpose, we generated infrared background sky based on low-resolution IRAS data and high-resolution artificial maps. As for the infrared source distribution, we employ a full range of published models that include source evolution (Pearson & Rowan-Robinson 1996; Pearson 2001). The source model incorporates 4 types of galaxy SEDs segregated by IRAS colors (Rowan-Robinson & Crawford 1989) and suitable luminosity function for each type of SED. The detection limits are estimated using the simulated data that take into account the detector and telescope characteristics realistically. Our main concern is whether the theoretical estimates are realistic and discuss the competing necessities of reliability and completeness. Throughout this presentation, we assume a concordance cosmology of H0 = 72 $km\ s^{-1}Mpc^{-1}$, Ωm = 0.3 and $\Omega\Lambda$ = 0.7 derived from the observational data based upon WMAP (Wilkinson Microwave Anisotropy Probe). The detection limits are consistent with the theoretical estimates in the case of no evolution model. However, the source detection in weak and strong evolution model is severly affected by the photon noise resulted from a lot of unresolved point sources as well as the source confusion.

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