

Herschel Key Project HERITAGE: The Dustiest Sources in the Magellanic Clouds

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Observations from *The Herschel Space Observatory* key project HERITAGE have been used to identify dusty populations of sources in the Large and Small Magellanic Clouds. We conducted the study using the HERITAGE Catalogs of sources from both the PACS (100 and 160 μm) and SPIRE (250, 350, and 500 μm) cameras. These catalogs are matched to each other to create a HERITAGE band-merged catalog and then further matched to archival *Spitzer* IRAC and MIPS catalogs from the *Spitzer* SAGE and SAGE-SMC surveys to create source catalogs that span the wavelength range from 3.6 to 500 μm . There are 35,322 unique sources in the LMC and 7,503 in the SMC; the sources in the HERITAGE catalogs represent the dustiest populations of sources in the Clouds. The brightest sources are dominated by young stellar objects, and the dimmest by background galaxies. We find a total of 9,745 background galaxy candidates in the LMC HERITAGE images and 5,111 in the SMC images, in agreement with the number predicted by extrapolating from the ATLAS flux distribution. The majority of the Magellanic Cloud-residing sources are either very young, embedded forming stars or dusty clumps of the interstellar medium. Using the presence of 24 μm emission as a tracer of star formation, we identify 3,518 YSO candidates in the LMC and 663 in the SMC. There are far fewer far-infrared bright YSOs in the SMC than the LMC due to both the SMC's smaller size and its lower dust content. The YSO candidate lists may be contaminated at low flux levels by background galaxies, and so we differentiate between sources with a high ("probable") and moderate ("possible") likelihood to be a YSO. There are 2,493/425 probable YSO candidates in the LMC/SMC. Approximately 73% of the Herschel YSO candidates are newly-identified in the LMC, 35% in the SMC. We further identify a small population of dusty objects in late stages of stellar evolution including extreme and post-AGBs, planetary nebulae, and supernova remnants.