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Title: Herschel-ATLAS: first data release of the Science Demonstration Phase source catalogues

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Abstract: The Herschel Astrophysical Terahertz LargeArea Survey (Herschel-ATLAS) is a survey of 550 deg(2) with the Herschel Space Observatory in five far-infrared and submillimetre bands. The first data for the survey, observations of a field 4 x 4 deg(2) in size, were taken during the Science Demonstration Phase (SDP), and reach a 5s noise level of 33.5 mJy beam(-1) at 250 mu m. This paper describes the source extraction methods used to create the corresponding SDP catalogue, which contains 6876 sources, selected at 250 mu m, within similar to 14 deg(2). Spectral and Photometric Imaging REciever (SPIRE) sources are extracted using a new method specifically developed for Herschel data and Photodetector Array Camera and Spectrometer (PACS) counterparts of these sources are identified using circular apertures placed at the SPIRE positions. Aperture flux densities are measured for sources identified as extended after matching to optical wavelengths. The reliability of this catalogue is also discussed, using full simulated maps at the three SPIRE bands. These show that a significant number of sources at 350 and 500 mu m have undergone flux density enhancements of up to a factor of similar to 2, due mainly to source confusion. Correction factors are determined for these effects. The SDP data set and corresponding catalogue will be available from www.h-atlas.org.