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The evolution of the 98 GHz ACT source population since $z = 4.5$

This research focuses on more than 15,000-millimetre wavelength sources observed using the Atacama Cosmology Telescope. These sources cover an area of approximately 18,000 square degrees and the ACT data observed at 98 GHz allows us to have a large population of AGNs at different redshift bands. This makes it possible to study the light these AGNs released at a redshift of up to 4.5, corresponding to the lookback time of about 11.9 Gyr. We also cross-matched the ACT data with radio data from RACS, MALS, VLASS, and FIRST surveys, enabling us to look at sources that other surveys could not detect (as the sources are faint). Also, we use redshift data from the Gaia-unWISE Quasar catalogue, which consists of spectrophotometric redshifts. We will look at luminosity functions for the number density of these sources at different redshift bands. We will fetch images from different wavelengths (radio, infrared, optical, and X-ray) to look at the environments and morphologies of these sources and see if they have common structures at different redshift bands.

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