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Finding dusty AGNs from the JWST CEERS survey with mid-infrared photometry

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The nature of the interaction between active galactic nuclei (AGNs) and their host galaxies remains an unsolved question. Therefore, conducting an AGN census is valuable to AGN research. Nevertheless, a significant fraction of AGNs are obscured by their environment, which blocks UV and optical emissions due to the dusty torus surrounding the central supermassive black hole (SMBH). To overcome this challenge, mid-infrared (IR) surveys have emerged as a valuable tool for identifying obscured AGNs, as the obscured light is re-emitted in this range. With its high sensitivity, the James Webb Space Telescope (JWST) can uncover more fainter objects than previous telescopes. In this work, we investigate the properties of AGN contribution (f_{AGN}) to the total infrared luminosity and the population of AGN, which is the AGN number fraction (f_{num}) in total sources. We discovered 42 candidates for 30 composites ($0.2 \leq f_{AGN} \leq 0.5$) and 12 AGNs ($f_{AGN} \geq 0.5$). We report that AGN contribution might increase as the redshift grows. Moreover, we found out that most of our composite and AGN candidates have lower luminosity than previous studies with Spitzer/AKARI, showing the advantage of using the JWST to search fainter objects.

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