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Radio continuum emission predominantly traces star-formation in radio-quite active galactic nuclei

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We investigate whether radio emission primarily traces star formation in RQ AGN. Our sample consists of 5223 galaxies detected by the MeerKAT International GHz Tiered Extragalactic Exploration (MIGHTEE) survey with multi-wavelength counterparts up to a $z \approx 6$ limit. We classified the sources using the infrared-to-radio luminosity ratio ($q_{\mathrm{IR})}$, X-ray luminosity cuts, and mid-infrared colour cuts into RQ AGN, radio-loud AGN (RL AGN), and star-forming galaxies (SFGs). We calibrated the star formation rate (SFR)-1.4 GHz radio luminosity ($L_{1.4\ \mathrm{GHz}}$) relation for both RQ AGN and SFGs. We find that in both populations SFR correlates positively with $L_{1.4\ \mathrm{GHz}}$, with average Spearman's rank correlation coefficients of 0.71 for RQ AGN and 0.76 for SFGs. With these results, we conclude that radio continuum from RQ AGN primarily traces star formation. This implies that we trace free-free and synchrotron emission in star-forming regions of the host galaxy, with the AGN jet component contributing less.

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