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The evolution of IR-radio relation for AGN hosts and starbursts at intermediate and high redshift in the COSMOS field

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The IR/radio properties of galaxies at successively higher redshift have been probed in the past decade using either statistical samples from cosmological survey fields or dedicated samples of specific objects (e.g. sub-mm galaxies). I will mention how the galaxy populations targeted by current radio surveys compare with those that the SKA could detect and briefly discuss – following the presentation in Murphy et al. 2009 – how studies of the IR-radio relation using SKA are expected to place constraints on the properties of the ISM of high-redshift galaxies.

Based on the VLA-COSMOS 1.4 GHz and S-COSMOS 24 & 70 μm observations of the 2 sqdeg COSMOS field I will present our measurements of the (non-)evolution of the IR-radio relation out to high redshift. In our analysis we employ the methods of survival analysis in order to ensure a statistically sound treatment of flux limits arising from non-detections. This allows us to study a volume-limited sample of ULIRGs at $z < 2$ with which we provide firm support for previous findings that the IR-radio relation has remained unchanged in IR-bright galaxies since the peak of cosmic star formation activity. Furthermore, we determine the observed shift in average IR/radio properties of IR- and radio-selected populations and I will show that it can reconcile apparently discrepant measurements of the average IR/radio ratio of distant galaxies presented in the literature.

Finally, and if time allows, I will also touch on our recent measurements of average IR/radio ratios for mass-selected COSMOS galaxies using IR and radio image stacking which probes LIRG luminosities out to $z \sim 2$.

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