X08a The faint-end of the radio luminosity function of ALMA-selected galaxies

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The radio luminosity function of quasars has been known that there is a bump-like feature on the faint-end. Given the assumption that the radio emission of a quasar is contributed by both its AGN and the star formation activity in the host galaxy, previous studies suggest that the radio emission originating from the star formation activity dominates the faint-end of their radio luminosity function, although this has not yet been proved due to the lack of deep infrared and radio surveys. ALMA-selected sources allow us to avoid the bias of AGN, so their radio luminosity function can help us trace the nature of quasar-host galaxies. We use data of ALMA twenty-six arcmin^2 survey of GOODS-S at one-millimeter (ASAGAO; $1\sigma \sim 61$ μJy/beam) and a very deep ($1\sigma \sim 0.7(0.3)$ μJy/beam at 3(6) GHz) JVLA survey in the same region, to derive the faint-end of the radio luminosity function of dusty star-forming galaxies. We cross-matched the catalog of two surveys and found that 17 sources ($S_{1.2\mathrm{mm}} \sim 2.0 - 0.24$ mJy; $S_{3\mathrm{GHz}} \sim 42 - 6.2$ μJy), ranging from redshift 1 to 3, have counterparts within $1''$. We divided them into three redshift bins and found that the resulting radio luminosity functions in all three bins are consistent with both the bump-like shape and the Schechter function, due to the large Poisson uncertainty. While thanks to the deep data, we made the constraint at $\log L_{6\mathrm{GHz}} \sim 22.6 - 24.2$ WHz^{-1}, and the tendency of decrease of the number density on the most faint-end may support the postulate.