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Multiwavelength study of the galaxy population in the young cluster RXJ1257.2+4738 at $z = 0.866$

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Abstract

We present the first results of a study on the impact of the environment in the evolution of galaxies using a multiwavelength analysis of the young cluster RXJ1257.2+4738, from the optical to the far infrared, covering two virial radii. Our data set includes new observations of the GLACE survey —g', r', i', z' bands with OSIRIS/GTC and J band with LIRIS/WHT— and PACS and SPIRE imaging photometry, along with existing MIPS and IRAC observations. We have processed GMOS spectra that confirm 24 cluster members. With our wide wavelength coverage, we have computed photometric redshifts by spectral energy distribution (SED) fitting using the LePhare code to compile a catalogue of more than 500 strong cluster member candidates. From these, about 100 have been detected in either mid-IR or far-IR. For these objects, we have derived the star formation rate (SFR), that ranges from less than 1 $M_\odot$/yr to more than 100 $M_\odot$/yr, and the specific SFR (sSFR) using the stellar masses derived from SED fitting. We find that: (i) sSFR median values do not correlate with environment. High-mass galaxies have lower sSFR than low-mass galaxies in all environments, and (ii) the cluster mass-normalised global SFR coarsely agrees with the $\propto (1+z)^6$ evolution proposed by other authors.