

X43a Wide and Deep Exploration of RGs with Subaru HSC (WERGS): The Environment of High- z Radio Galaxies at $z \sim 4$

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High- z radio galaxies (HzRGs) have been thought to be useful probes of large-scale structure, pointing towards the possible sites of galaxy overdensities, which are good laboratories for studying the environmental effects on the properties and evolution of galaxies. However, the number of known HzRGs at $z > 4$ is critically small. This means that a consistent picture of the environment of HzRGs needs to be derived. We examine a possible correlation between protocluster and high- z radio galaxy (HzRG) candidates constructed from Hyper Suprime-Cam Subaru Strategic Program at $z \sim 4$. The protoclusters are defined by the g -dropout overdense regions with $> 4\sigma$ significance (Toshikawa et al. 2018). The HzRG sample is extracted from a radio galaxy survey of Wide and Deep Exploration of RGs with Subaru HSC, “WERGS” (Yamashita et al. 2018). We investigate whether the HzRGs live in the overdense regions by comparing the overdensity distribution around HzRGs to that around g -dropouts. To further examine the average environment of HzRGs, we measure the median stacked overdensity significance map around all HzRGs and g -dropouts. Finally, we discuss what descendant halo masses the protoclusters associated with the HzRGs are expected to evolve into using light cone model.