T12a   AGN properties of about 1 million member galaxies of galaxy groups and clusters at z < 1.4 based on the Subaru Hyper Suprime-Cam survey

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This study presents the statistical properties of active galactic nuclei (AGNs) for approximately 1 million member galaxies of galaxy groups and clusters with $0.1 <$ cluster redshift $(z_{\rm cl}) < 1.4$ selected using the Subaru Hyper Suprime-Cam, known as the CAMIRA clusters. The research focuses on the AGN power fraction $(f_{\rm AGN})$, defined as the proportion of the contribution of AGNs to the total infrared (IR) luminosity, $L_{\rm IR}$ (AGN)$/L_{\rm IR}$, and examines how $f_{\rm AGN}$ depends on (i) $z_{\rm cl}$ and (ii) the distance from the cluster center (R/R_{200}). Multiwavelength data were compiled using the UV–to–mid-IR range. Furthermore, spectral energy distribution fits were performed to determine $f_{\rm AGN}$ using the CIGALE code with the SKIRTOR AGN model. The findings indicate that (i) the value of $f_{\rm AGN}$ in the CAMIRA clusters is positively correlated with $z_{\rm cl}$, with the correlation slope being steeper than that for field galaxies, and (ii) $f_{\rm AGN}$ exhibits a high value at the cluster outskirts. These results suggest that the emergence of the AGN population depends on the redshift and environment and that galaxy groups and clusters at high redshifts are significant in AGN evolution. Additionally, the study demonstrates that cluster-cluster mergers may enhance AGN activity at the outskirts of particularly massive galaxy clusters (Toba et al. 2024a, ApJ, 967, 65).