X06a   A morphological study of galaxies with optical variability selected AGN

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Morphological study plays an important role to investigate the connections between AGN activities and the evolution of galaxies. For example, Kocevski et al. (2012) found a large fraction of undisturbed disk-like hosts in their visual inspection of X-ray-selected AGNs in the COSMOS field, questioning the merger-driven AGN fueling mechanism. In this study, we investigated the morphology of AGN hosts at $0 < z < 4.3$ through Sersic index and non-parametric parameters. The samples are taken from a catalog of 491 variability-selected Type 1 AGNs based on Subaru HSC g, r, i, z bands in the COSMOS field. We analyzed HST ACS/WFC F814W images by using a public code, statmorph, to measure the morphological parameters. Most of these AGNs are visually point or PSF-like sources. We could successfully measure the morphological parameters for only 46% of the sample. We examined the obtained morphological information as a function of redshift and compared literature data. As a result, we find that (1) at $0.2 < z < 1.0$, these Type 1 AGN hosts have larger flux distribution (Gini), smaller offsets of the brightest core (M20) and are more concentrated (larger Concentration), (2) with the increase of the redshift, the AGN hosts tend to have smaller Gini, larger M20 and smaller Concentration, but also almost invariant asymmetric structures, (3) these hosts are more likely to be Ellipticals or Spirals rather than mergers. On the other hand, they are more merger-like compared to those with more luminous hard X-ray, especially at higher redshifts. They also have higher probabilities to reside in disk galaxies, suggesting that the sample AGNs are fueled by secular processes of disk galaxies.