The Angular Clustering of WISE-selected AGN: Different Halos for Obscured and Unobscured AGN

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Resumen / We calculate the angular correlation function for a sample of ∼170,000 extracted from the Wide-File Infrared Survey Explorer (WISE) catalog, selected to have red mid-IR colors (W1-W2>0.8) and 4.6 μm flux densities brighter than 0.14 mJy. The sample is expected to be ¿90% reliable at identifying AGN, and to have a mean redshift of $\langle z \rangle = 1$. In total, the angular clustering of WISE AGN is roughly similar to that of optical AGN. We cross-match these objects with the photometric SDSS catalog and distinguish obscureds sources with r-W2>6 from bluer, unobscured AGN. Obscured soruces present a higher angular clustering signal than unobscured sources. Since the host galaxy morphologies of obscured AGN are not typical red sequence elliptical galaxies and show disks in many cases, it is not likely that the increased clustering strength of the obscured population is driven by a host galaxy segregation bias. By using relatively complete redshift distributions from the COSMOS survey, we find obscured sources at $\langle z \rangle = 0.9$ have a bias of b=2.9±0.6 and are hosted in dark matter halos with typical mass of $\log(M/M\odot\ h^{-1})\sim13.5$. In contrast, unobscured AGN at $\langle z \rangle = 1.1$ have a bias of b=1.6±0.6 and inhabit halos of $\log(M/M\odot\ h^{-1})\sim12.4$. These findings suggest that unobscured AGN inhabit denser environments than unobscured AGN, and are difficult to reconcile with the simplest AGN unification models where obscuration is driven solely by orientation of an obscuring dusty torus.

Palabras clave / Galaxies: active — Galaxies: statistics — Infrared: galaxies

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