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Halo Occupation of Quasars: AGN Unification From a Cosmological Perspective[1] KAUSTAV MITRA, SUCHETANA CHATTERJEE, Presidency University, Kolkata, MICHAEL DIPOMPEO, Dartmouth College, Hanover, ADAM MYERS, University of Wyoming, Laramie, ZHENG ZHENG, University of Utah, Salt Lake City — We use the angular two-point correlation function (2PCF) of obscured and unobscured quasars selected using the Wide-field Infrared Survey Explorer (WISE), at a median redshift of z $\sim$ 1. Our theoretical framework, a five-parameter Halo Occupation Distribution (HOD) model, derived from a cosmological hydrodynamic simulation by Chatterjee et al. (2012), was previously used to model the 2PCF of optically selected quasars and X-ray bright active galactic nuclei (AGN). The current work shows that a single HOD parametrization can be used to model the population of different kinds of AGN in dark matter halos suggesting the universality of the relationship between AGN and their host halos. Our results show that the median dark matter halo mass of central quasar hosts and the projected satellite fractions tend to increase from unobscured to obscured quasars, and hence tend to disfavor a simple 'orientation only' theory of AGN unification. We show that future measurements of the small-scale clustering of obscured quasars can put constraints on the current theories of AGN - supermassive black hole co-evolution, where quasars evolve from an IR-bright obscured phase to the optically bright unobscured phase.

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