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The Halo Occupation Distribution of X-ray-Bright Active Galactic Nuclei: A Comparison with Luminous Quasars S. CHATTERJEE, University of Wyoming, J. RICHARDSON, University of Chicago, Z. ZHENG, University of Utah, A. MYERS, University of Wyoming, R. HICKOX, Dartmouth College — We perform halo occupation distribution (HOD) modeling of the projected two-point correlation function (2PCF) of high-redshift ($z \sim 1.2$) X-ray-bright active galactic nuclei (AGN) in the XMM-COSMOS field measured by Allevato et al. (2011). The HOD parameterization is based on low-luminosity AGN in cosmological simulations. At the median redshift of $z \sim 1.2$, we derive a median mass of $1.02^{+0.21}_{-0.23} \times 10^{13}\ hMsun$ for halos hosting central AGN and an upper limit of $\sim 10\%$ on the AGN satellite fraction. Our modeling results indicate (at the 2.5σ level) that X-ray AGN reside in more massive halos compared to more bolometrically luminous, optically-selected quasars at similar redshift. The modeling also yields constraints on the duty cycle of the X-ray AGN, and we find that at $z \sim 1.2$ the average duration of the X-ray AGN phase is two orders of magnitude longer than that of the quasar phase. Our inferred mean occupation function of X-ray AGN is similar to recent empirical measurements with a group catalog and suggests that AGN halo occupancy increases with increasing halo mass. We project the *XMM*-COSMOS 2PCF measurements to forecast the required survey parameters needed in future AGN clustering studies to enable higher precision HOD constraints and determinations of key physical parameters like the satellite fraction and duty cycle. We find that $N^2/A \sim 5 \times 10^6$ deg^{-2} (with N the number of AGN in a survey area of A deg^2) is sufficient to constrain the HOD parameters at the 10% level, which is easily achievable by upcoming and proposed X-ray surveys.

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