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A Direct Measurement of the Mean Occupation Function of Quasars: Breaking Degeneracy of Halo Occupation Distribution Models M.L. NGUYEN, S. CHATTERJEE, A.D. MYERS, Department of Physics and Astronomy, University of Wyoming — The Halo Occupation Distribution (HOD) of quasars has been recently studied using the measured two-point correlation function of quasars. In this approach the derived HOD properties (satellite fraction, host halo mass distribution, etc) of quasars depend on the functional form of the Mean Occupation Function (MOF), thus allowing degeneracy on the derived parameters within the statistical uncertainty of the measured clustering. In particular, the shape of the MOF is uncertain at the high mass end. In this work, for the first time, we perform a direct measurement of the quasar MOF by cross-matching quasars at low redshift (0.1-0.3) from the Sloan Digital Sky Survey (SDSS) DR7 with the SDSS MaxBCG cluster catalog. The masses of the clusters are computed using the modified richness-mass calibration of. We show that in the halo mass range $10^{13.5} - 10^{15.2}\mathrm{M}_{\odot}$, the quasar occupation function increases monotonically with mass. We perform a 5 parameter fit to the occupation function using the model in, which has been derived using a cosmological hydrodynamic simulation of low luminosity active galactic nuclei (AGN). The result of this study will be invaluable in future HOD modeling of AGN and quasar clustering. This work is supported by the National Science Foundation through grant number 1211112 by NASA through ADAP award NNX12AE38G and Chandra award number AR0-11018C issued by the Chandra X-ray Observatory Center, which is operated by the Smithsonian Astrophysical Observatory for and on behalf of the National Aeronautics Space Administration under contract NAS8-03060.

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