Abstract Submitted for the 4CF13 Meeting of The American Physical Society

A Direct Measurement of the Mean Occupation Function of Quasars: Breaking Degeneracies between Halo Occupation Distribution Models¹ MY NGUYEN, SUCHETANA CHATTERJEE, ADAM MYERS, Univ of Wyoming, ZHENG ZHENG, Univ of Utah — Recent work on quasar clustering suggests a degeneracy in the halo occupation distribution constrained from two-point correlation functions. To break the degeneracy, we make the first direct measurement of the mean occupation function (MOF) of quasars at $z \sim 0.2$ by matching quasar positions with clusters in the MaxBCG sample. We fit a power law and a 4-parameter model to the MOF. The number distribution of quasars in host halos is close to Poisson, and the slopes obtained for the power law case favor a monotonically increased MOF with halo mass. The best-fit slopes are 0.53 ± 0.04 for the power law model and 1.03 ± 1.12 for the 4-parameter model. The radial distribution of quasars within halos is described by a power law with a slope -2.3 ± 0.4 . The conditional luminosity function (CLF) of quasars shows no evidence of luminosity evolution with host halo mass, similar to the inferences drawn from clustering measurements. Although the conditional black hole mass function (CMF) is consistent with no evolution, we observe a slight indication of downsizing of the black hole mass function. The lack of evolution in the CLF and the CMF shows that quasars, residing in clusters have a characteristic mass and luminosity scale independent of their host halos.

¹This work is supported at Univ of Wyo by the NSF through grant number 1211112, and by NASA through ADAP award NNX12AE38G, and EPSCoR grant NNX11AM18A. At Univ of Utah this work is supported in part by NSF grant AST-1208891

My Nguyen Univ of Wyoming

Date submitted: 18 Sep 2013 Electronic form version 1.4