Astrophysics > Cosmology and Extragalactic Astrophysics

The spatial distribution of cold gas in hierarchical galaxy formation models

Han-Seek Kim (1), C.M. Baugh (1), A.J. Benson (2), S. Cole (1), C.S. Frenk (1), C.G. Lacey (1), C. Power (3), M. Schneider (1) ((1)Durham, (2)Caltech, (3)Leicester)

(Submitted on 26 Feb 2010)

The distribution of cold gas in dark matter haloes is driven by key processes in galaxy formation: gas cooling, galaxy mergers, star formation and reheating of gas by supernovae. We compare the predictions of four different galaxy formation models for the spatial distribution of cold gas. We find that satellite galaxies make little contribution to the abundance or clustering strength of cold gas selected samples, and are far less important than they are in optically selected samples. The halo occupation distribution function of present-day central galaxies with cold gas mass > 10^9 h^-1 Msun is peaked around a halo mass of ~ 10^11 h^-1 Msun, a scale that is set by the AGN suppression of gas cooling. The model predictions for the projected correlation function are in good agreement with measurements from the HI Parkes All-Sky Survey. We compare the effective volume of possible surveys with the Square Kilometre Array with those expected for a redshift survey in the near-infrared. Future redshift surveys using neutral hydrogen emission will be competitive with the most ambitious spectroscopic surveys planned in the near-infrared.

Comments:	19 pages, 15 figures, To appear in MNRAS
Subjects:	**Cosmology and Extragalactic Astrophysics (astro-ph.CO)**; Galaxy Astrophysics (astro-ph.GA)
Cite as:	**arXiv:1003.0008v1 [astro-ph.CO]**

Submission history

From: Han-Seek Kim [view email]
[v1] Fri, 26 Feb 2010 21:17:39 GMT (1355kb)

Which authors of this paper are endorsers?