

# The STAGES Supercluster: A challenge for semi-analytical models?

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# The STAGES field

- Multiwavelength survey of the complex Abell 901/902 supercluster (4 clusters?)
- Aim to explore the environmental drivers of galaxy evolution
- Hubble imaging, ground based 17-band imaging (photo-z), XMM
- Weak lensing from HST data reveals DM distribution



**A901a**

**A901b**

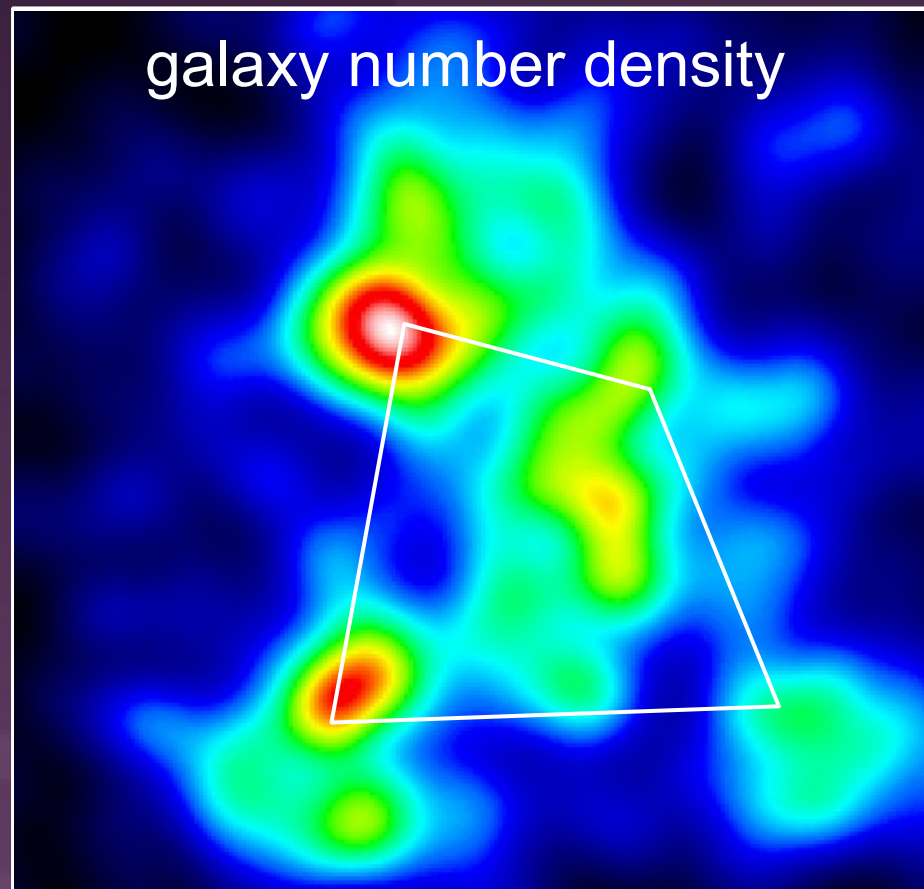
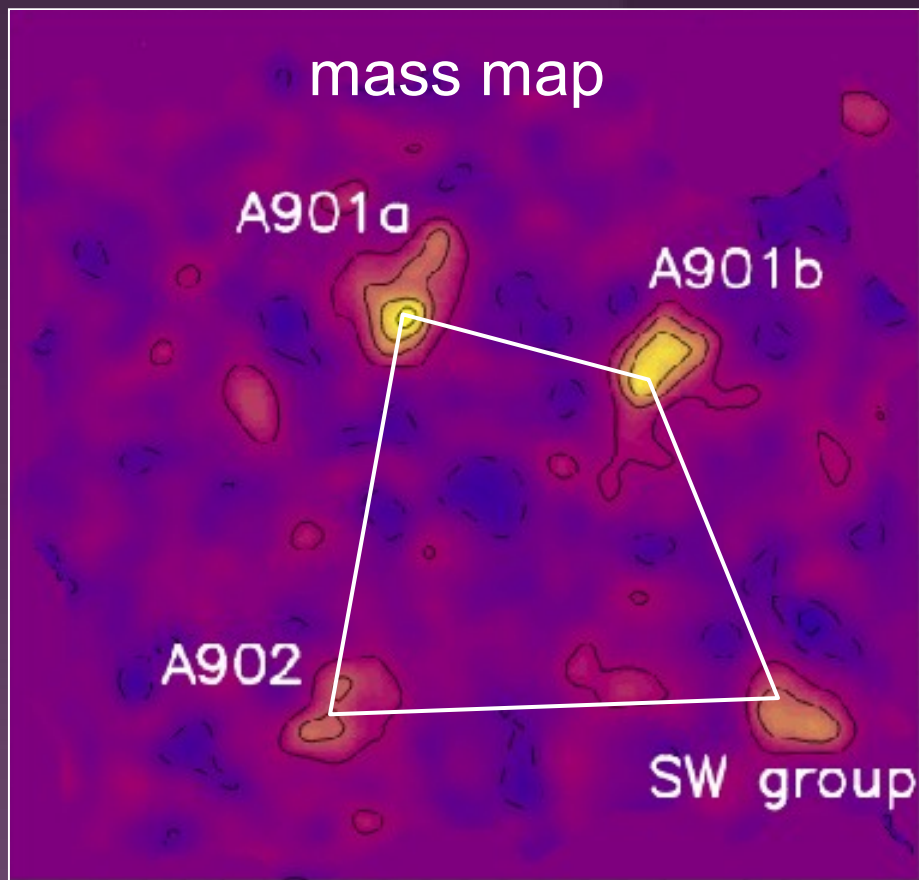
**A902**

**SW group**

**Image: Heymans et al 2008**

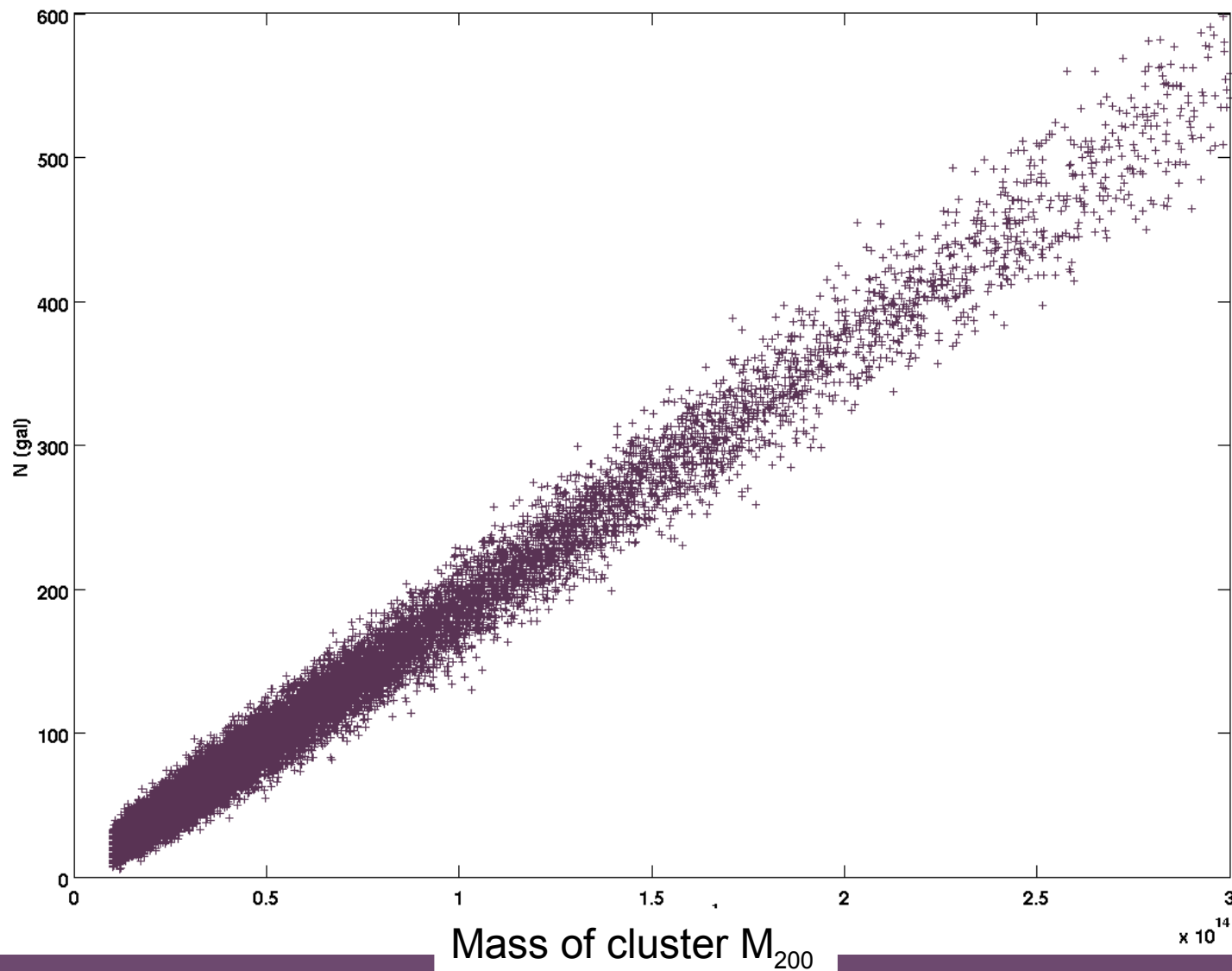


# Is this a challenge?



# Is this a challenge?

Number of galaxies

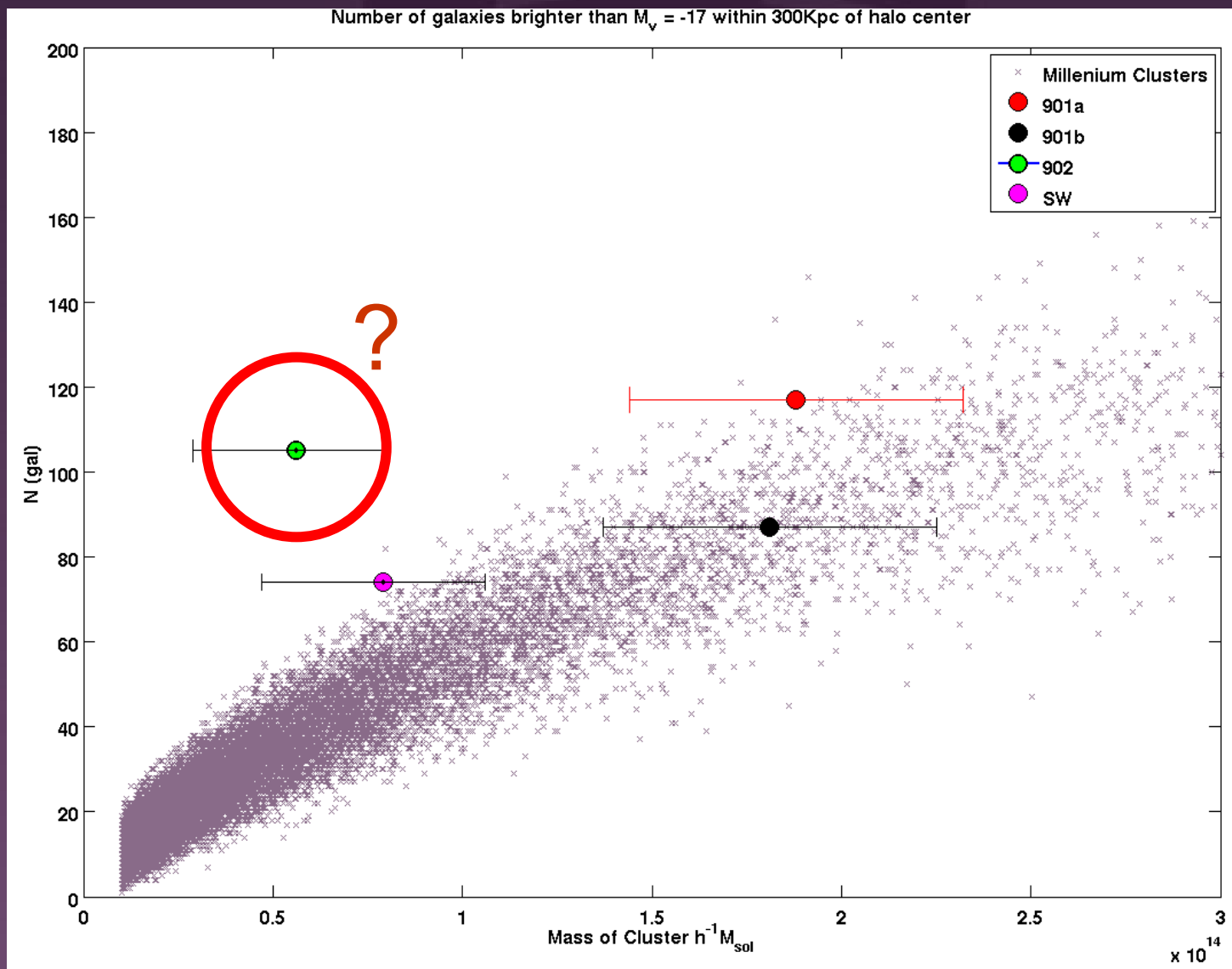


Croton model

# A more direct comparison

- Count galaxies down a fixed width column of  $450 h^{-1}$  Kpc for every cluster in the simulation
- Introduce a magnitude cut of  $M_v < -17$

# Is this a challenge?: Not as we thought



# A902?

- A901a/b difference in  $N_{\text{gal}}$  is reproduced in models
- A902 has ~twice the maximum number of galaxies predicted for its mass
- These columns are only cut through the galaxies within the DM halos of the clusters
- A902 also has two BGCs and two DM mass peaks



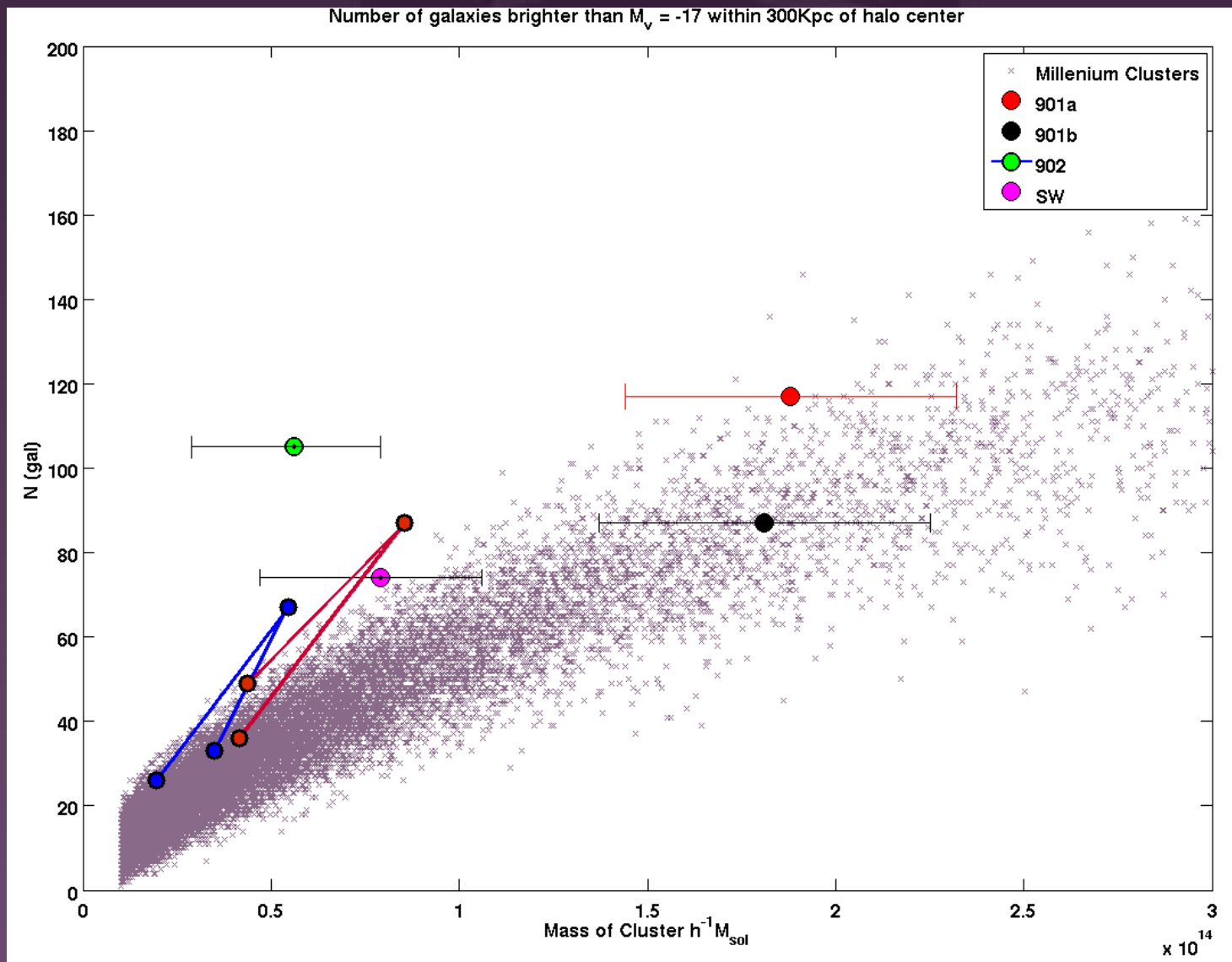
# Another look at A902



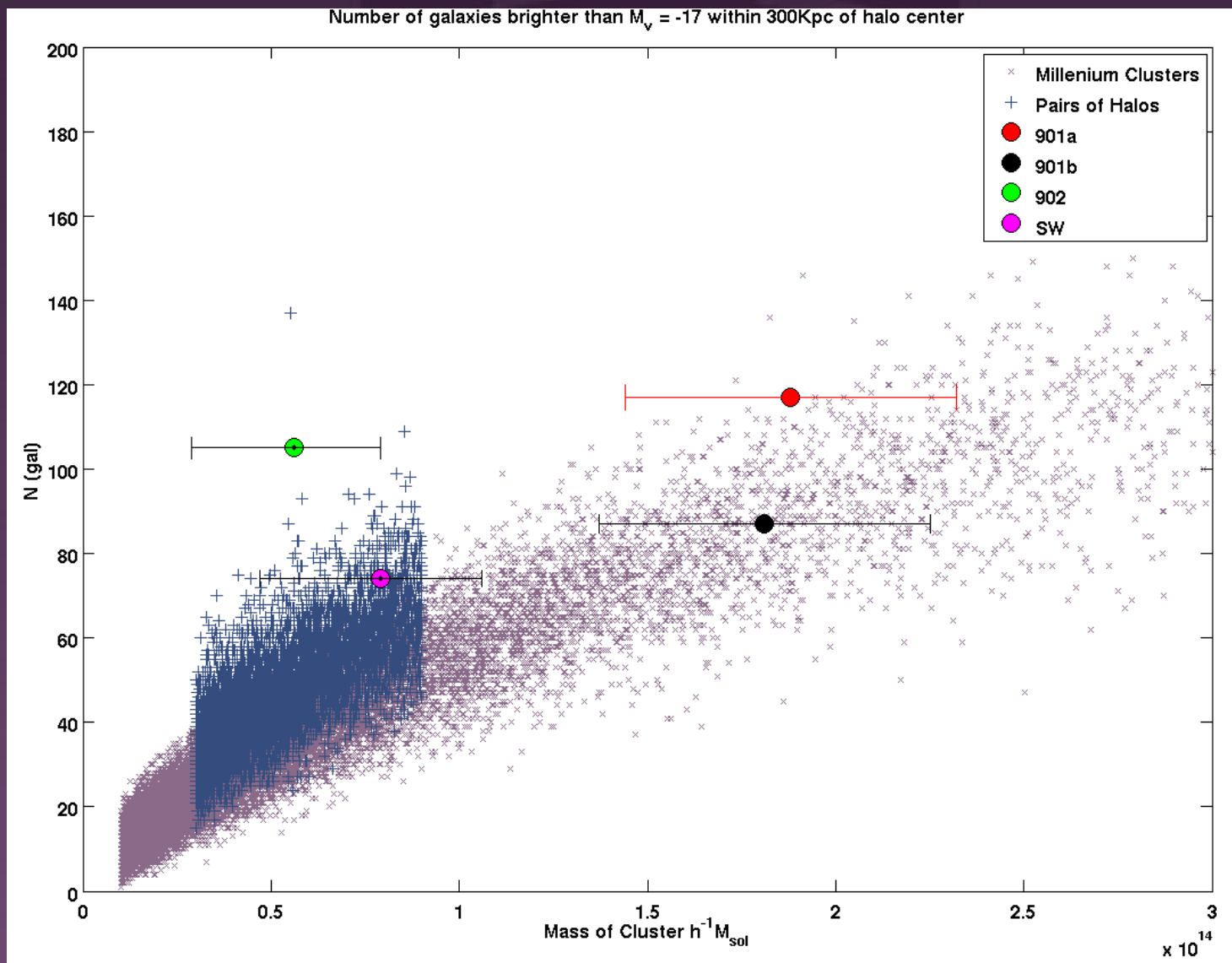
# A pair of clusters

- Two clusters in projection would give a combined lensing mass
- From previous plot two halos of half the mass would have  $\sim$ correct  $N_{\text{gal}}$
- Searched through halo catalogue for pairs of halos with combined mass of A902
- Cut columns through depth of both halo centres out to  $\pm 2\text{Mpc}$  with 450kpc radius

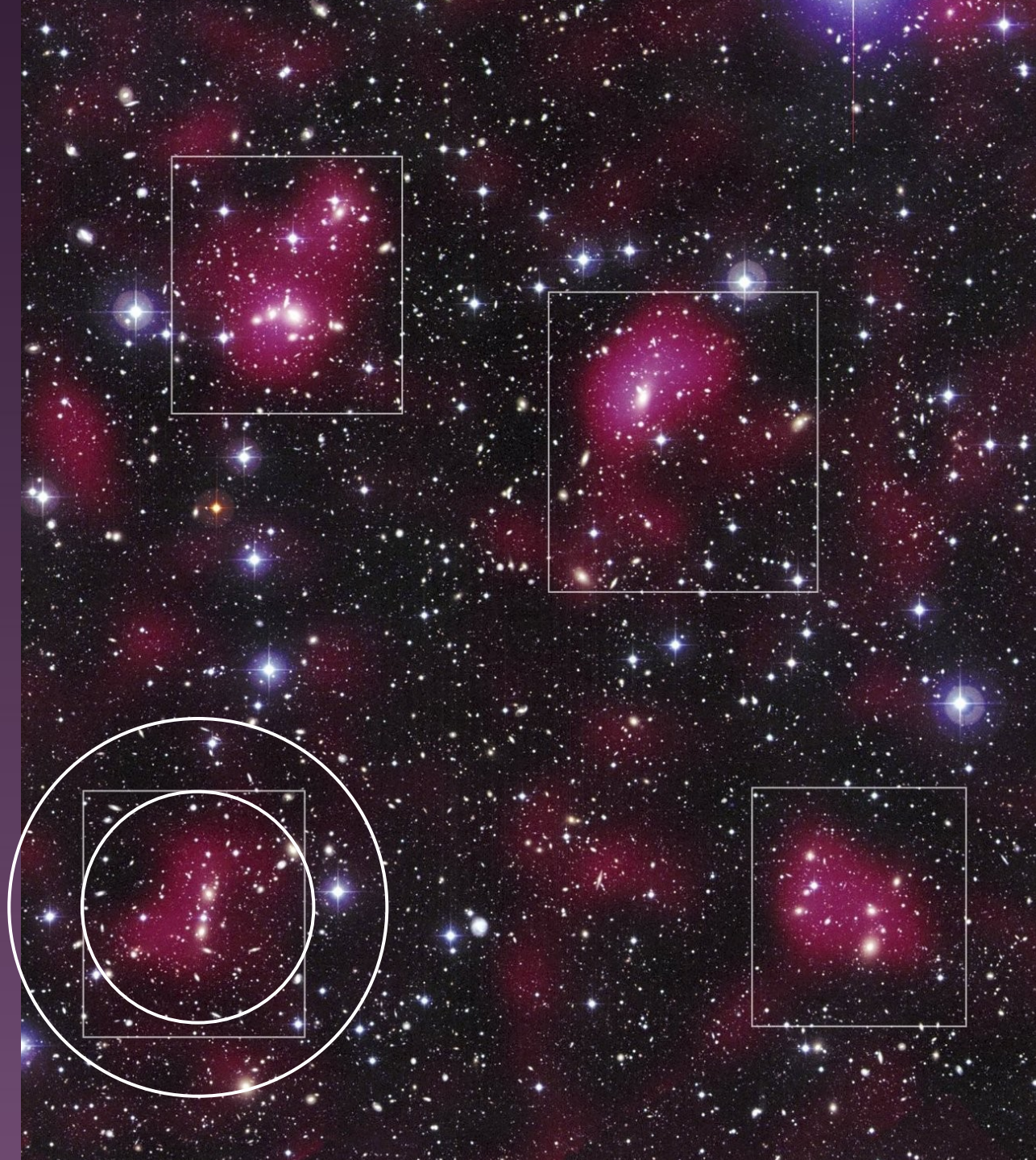
# Paired Clusters



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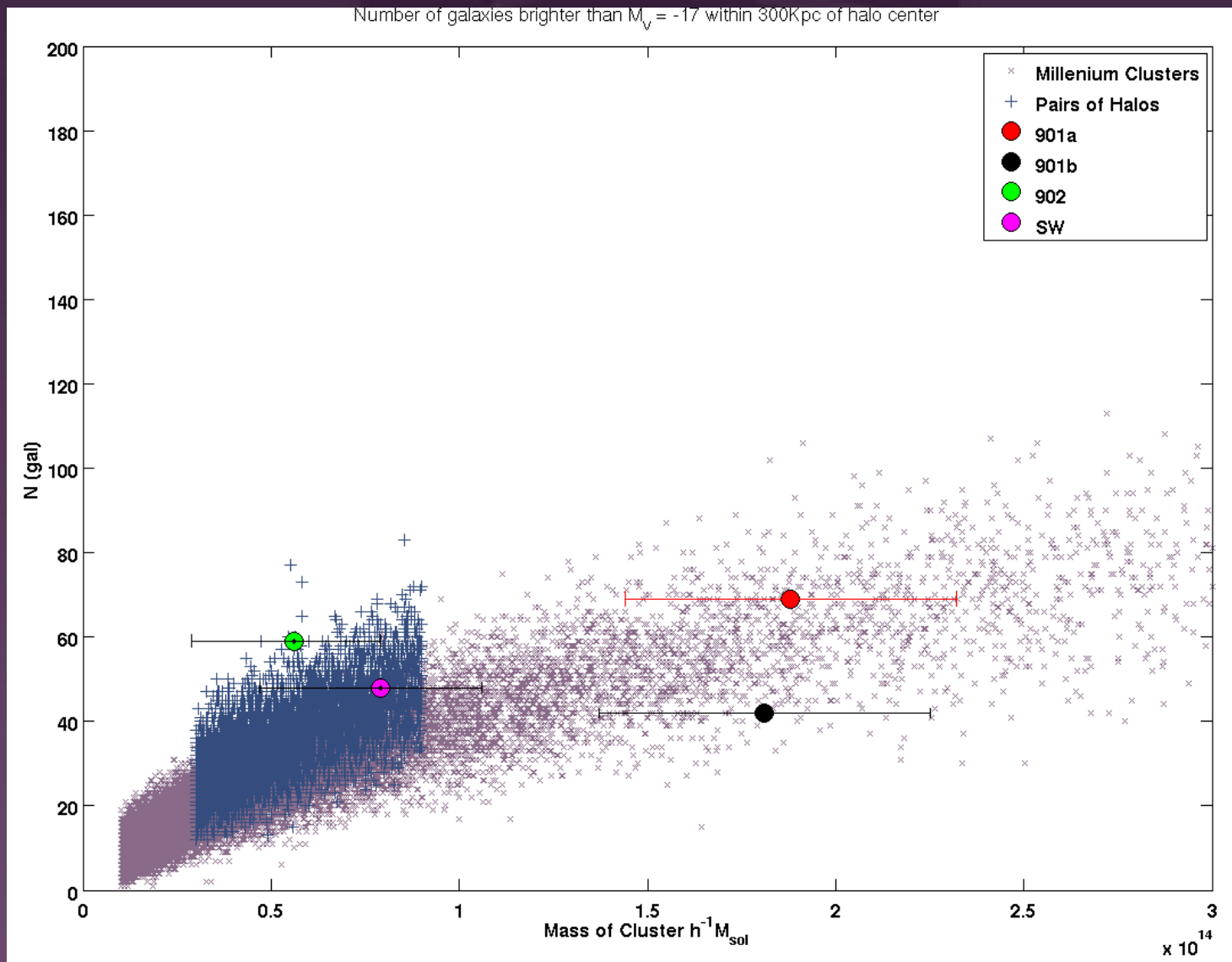




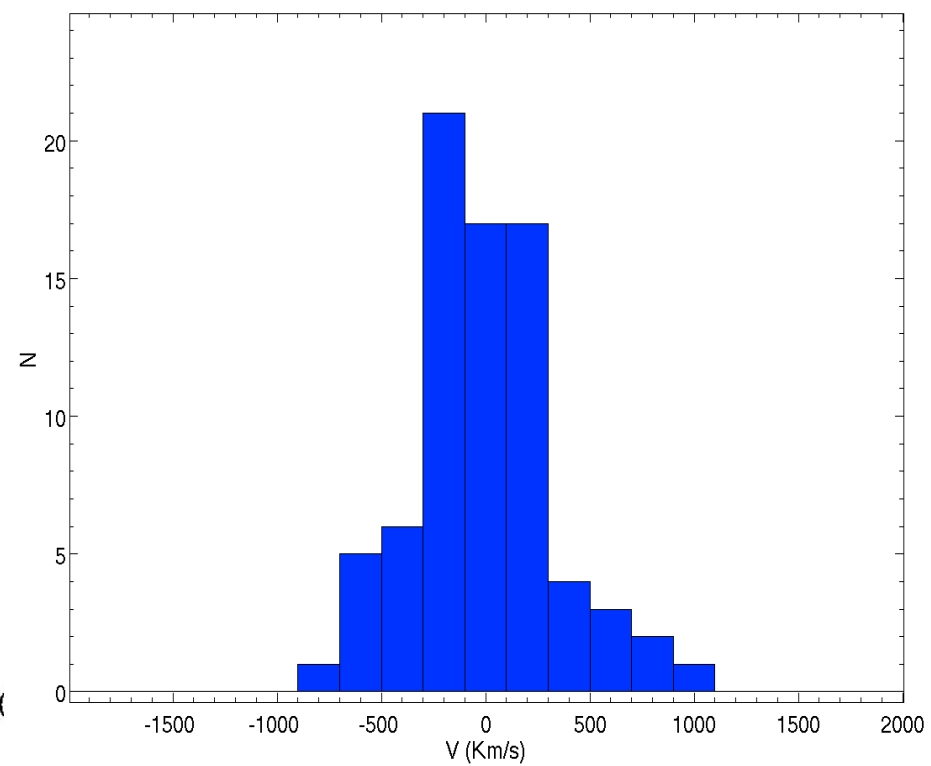
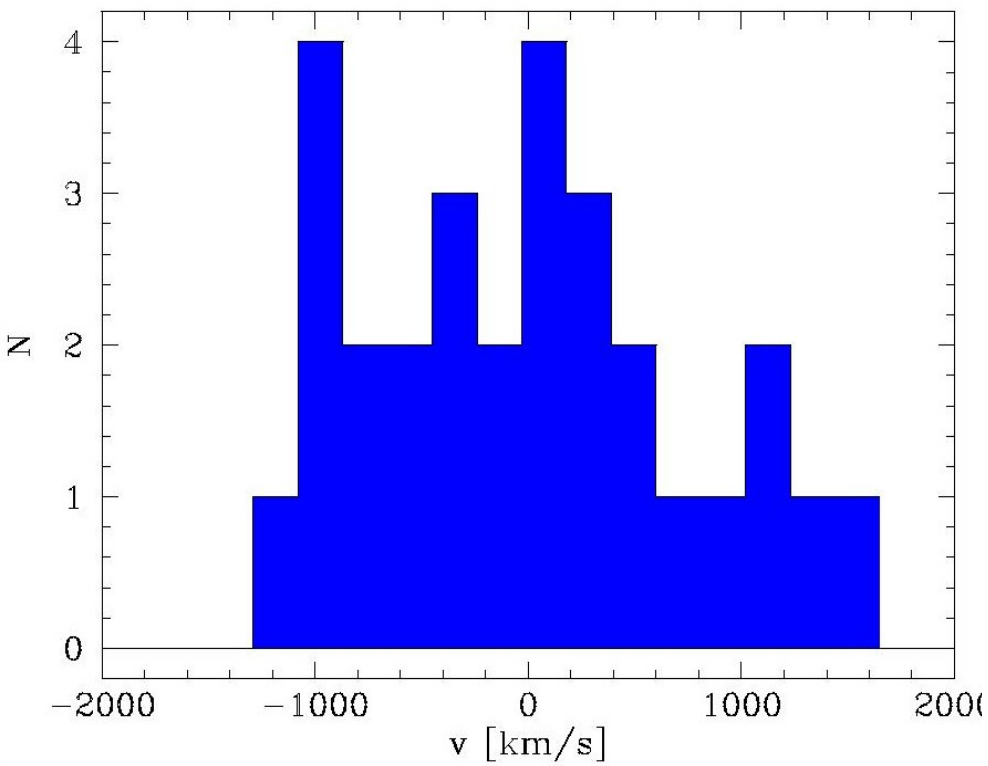




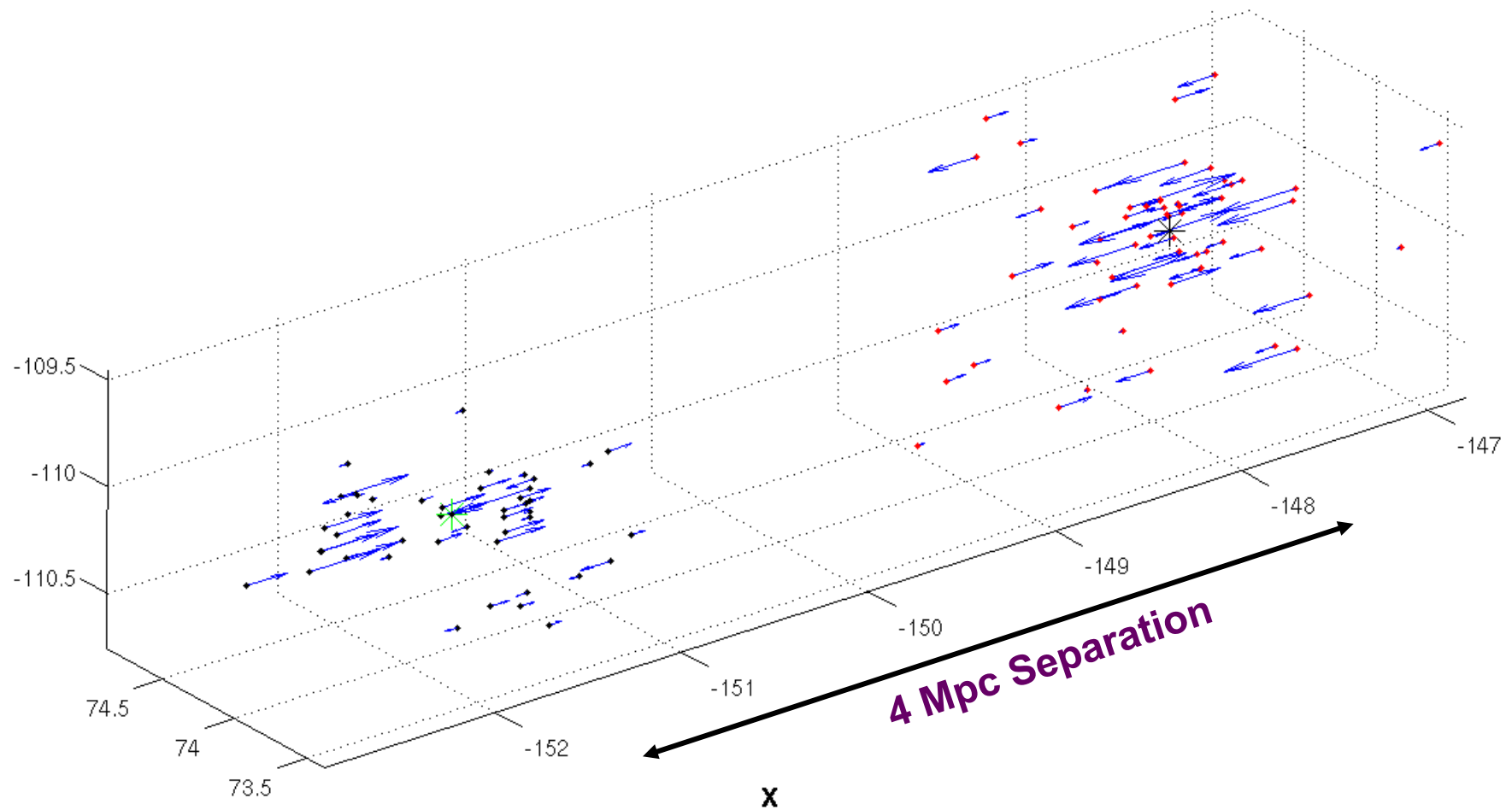
# Thinner Cut



# Histograms



# 3D Distributions



# Conclusions

- A901a/A901b galaxy count difference reproduced
- Models suggest A902 may be a pair of clusters along the line of sight
- So far the STAGES field has produced nothing which causes problems for the millennium galaxy models (sorry)
- However by comparing observations of our field with simulations we may have learned something about its structure

