

# Comparison of Observed X-ray and Weak Lensing Galaxy Cluster Scaling Relations with Simulations

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Acknowledgments to

**LoCuSS team, especially**

**A. Finoguenov (MPE / UMBC)**

**J.-P. Kneib (Marseille)**

**G. P. Smith (Birmingham)**

**N. Okabe (Sendai)**

**and**

**H. Boehringer (MPE)**

**R. Kneissl (MPIR)**

**H. Dahle (Marseille)**

**A. Vikhlinin (CfA)**

**T. H. Reiprich (AIfA)**

**G. Pratt (MPE)**

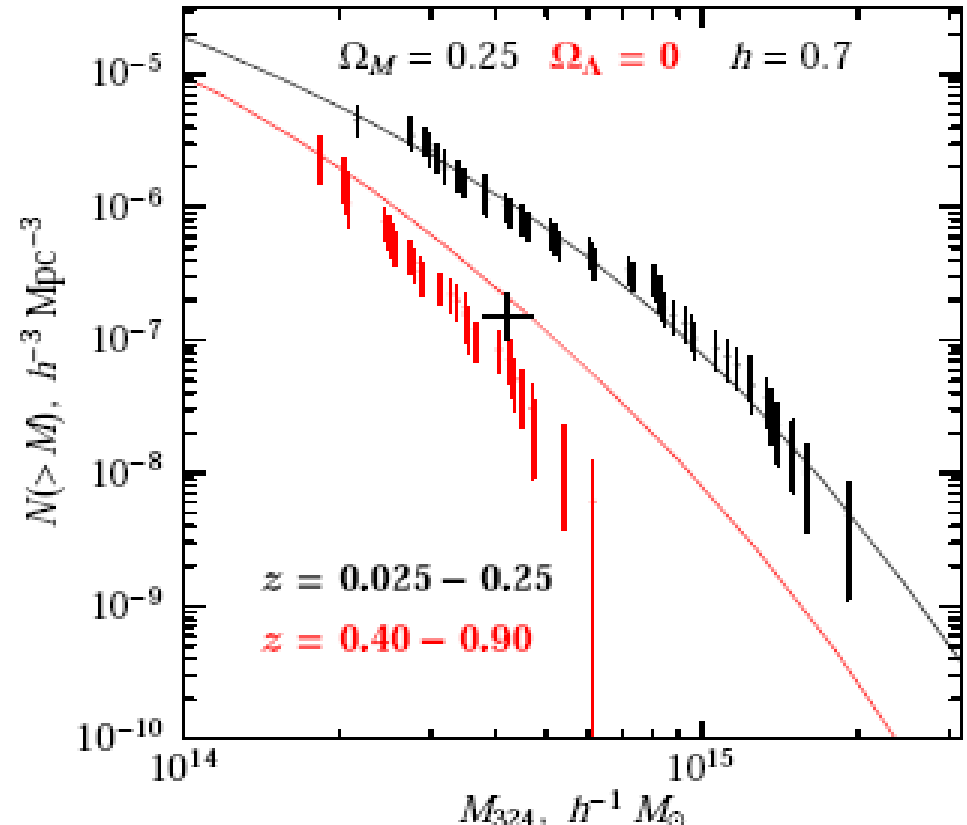
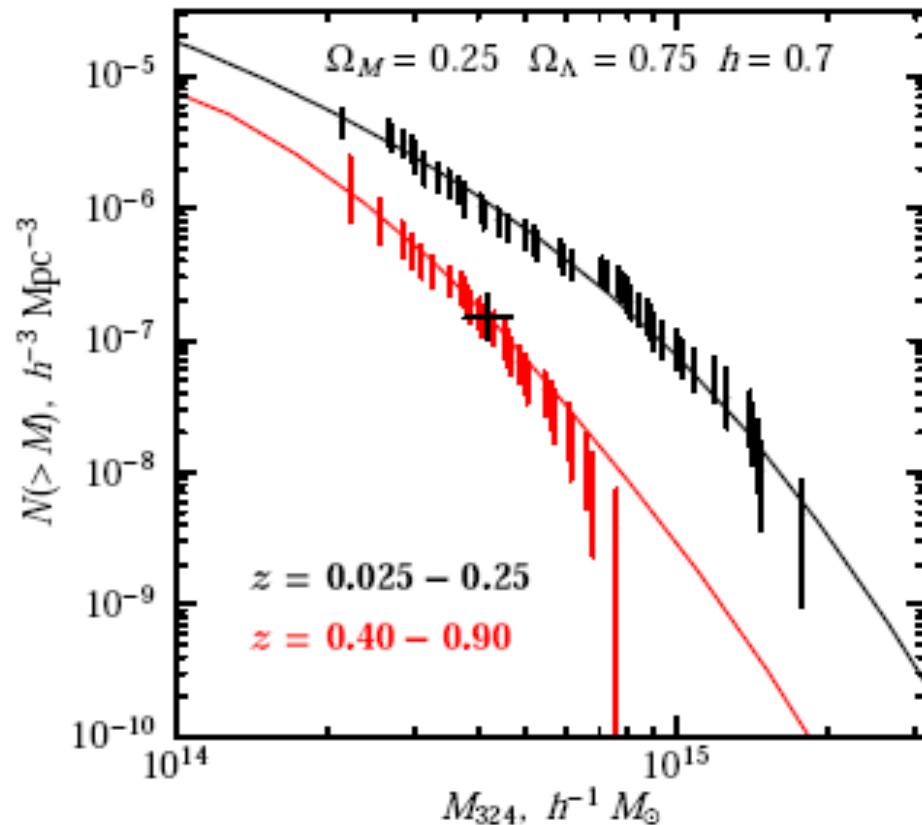
# Cosmology constraint using cluster mass function

Cosmological model

↓ by geometry  $D_a(z)$  &  $H(z)$

Mass function  $N(M, z) \sim \Delta M/M \sim n^{0.5}$

10,000 clusters, 0.6% in  $\Delta M/M$ , 1% in  $w$



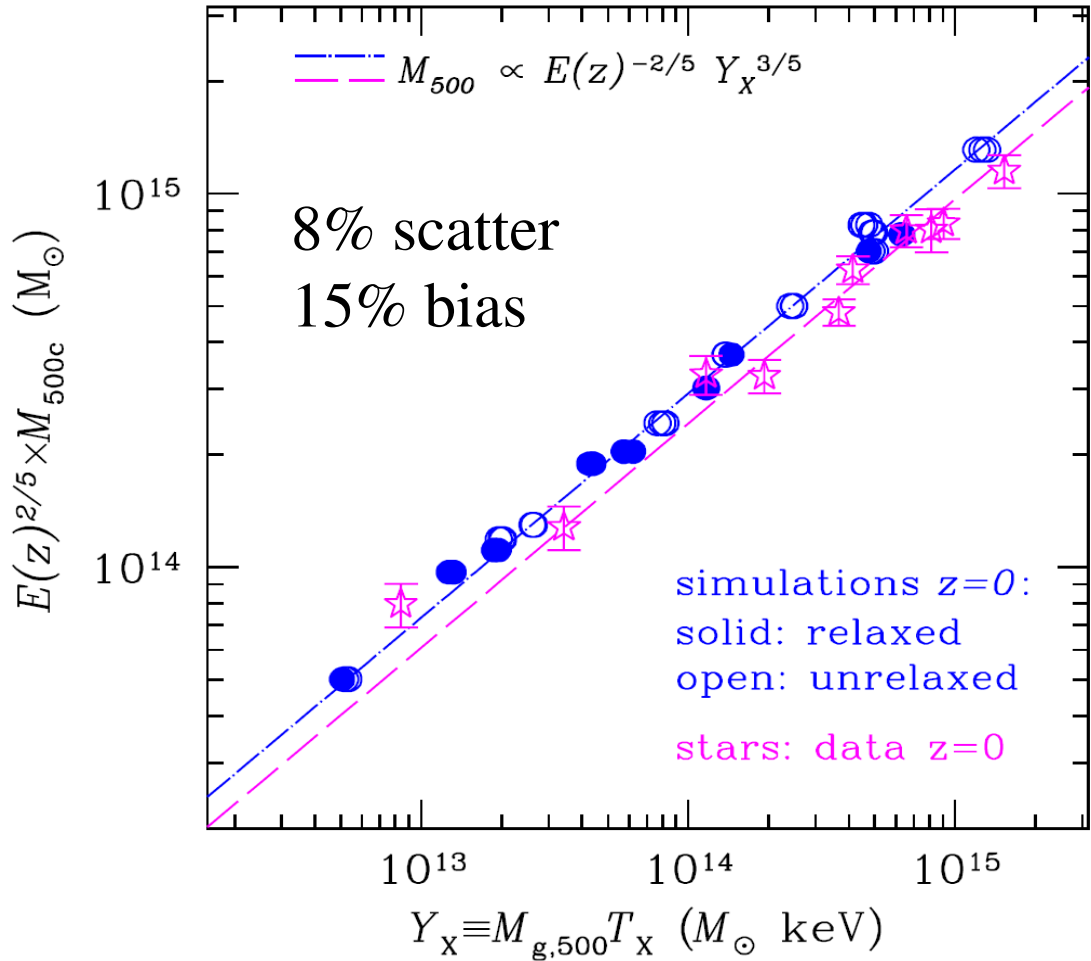
A. Vikhlinin

# Cluster mass indicator

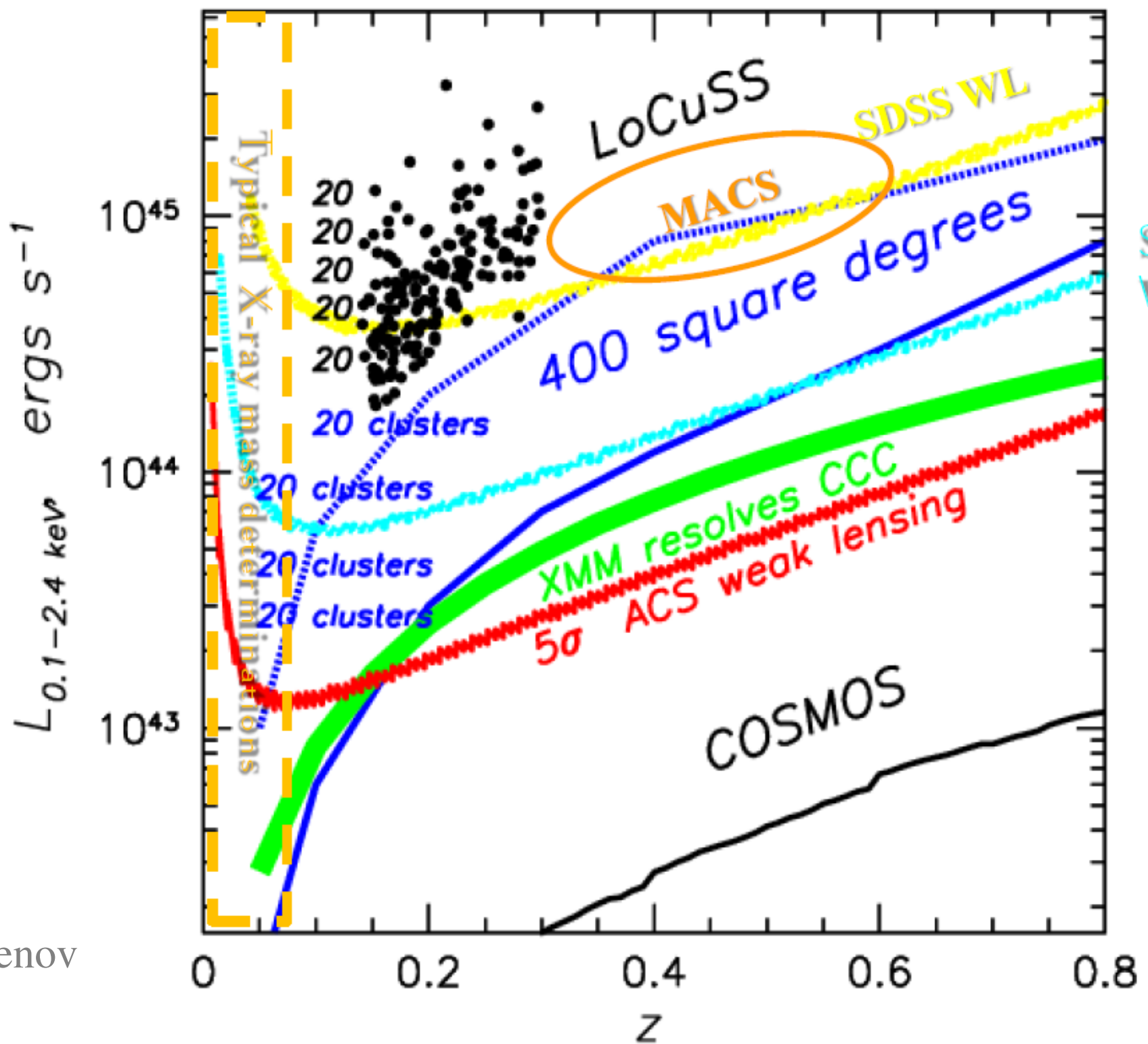
$N(M)$

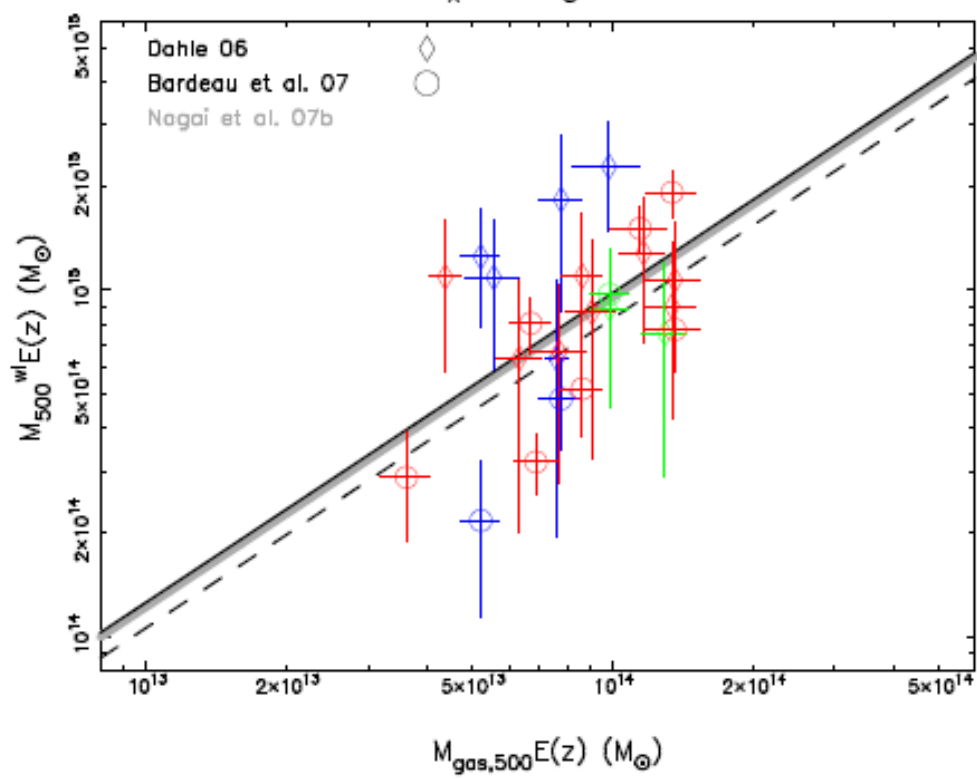
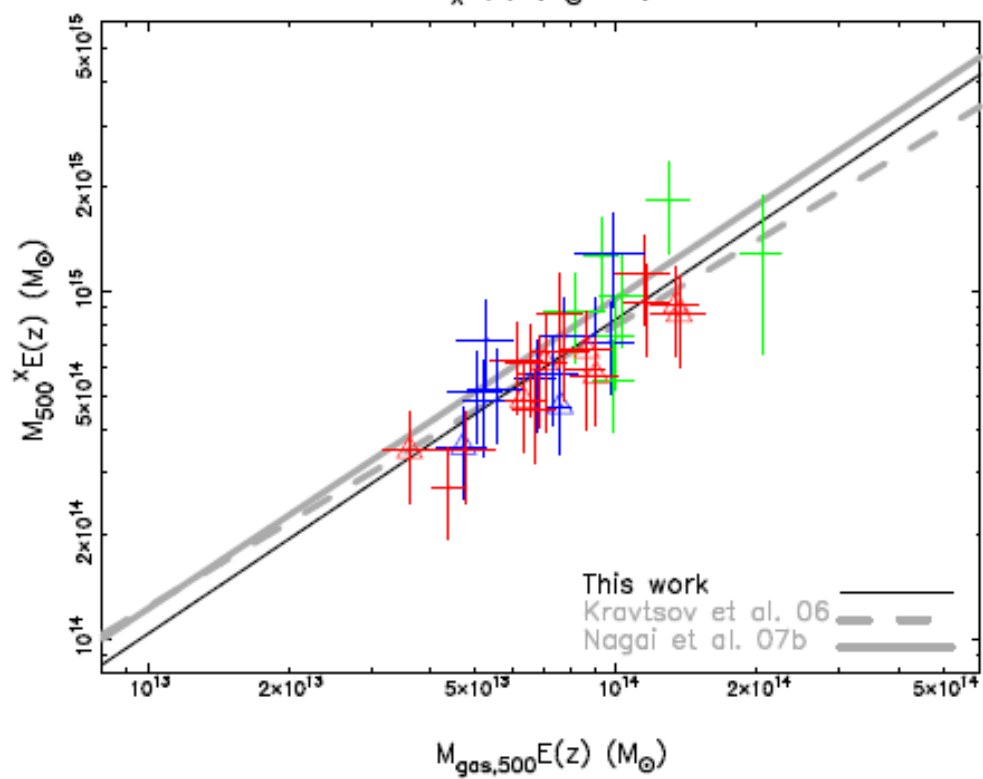
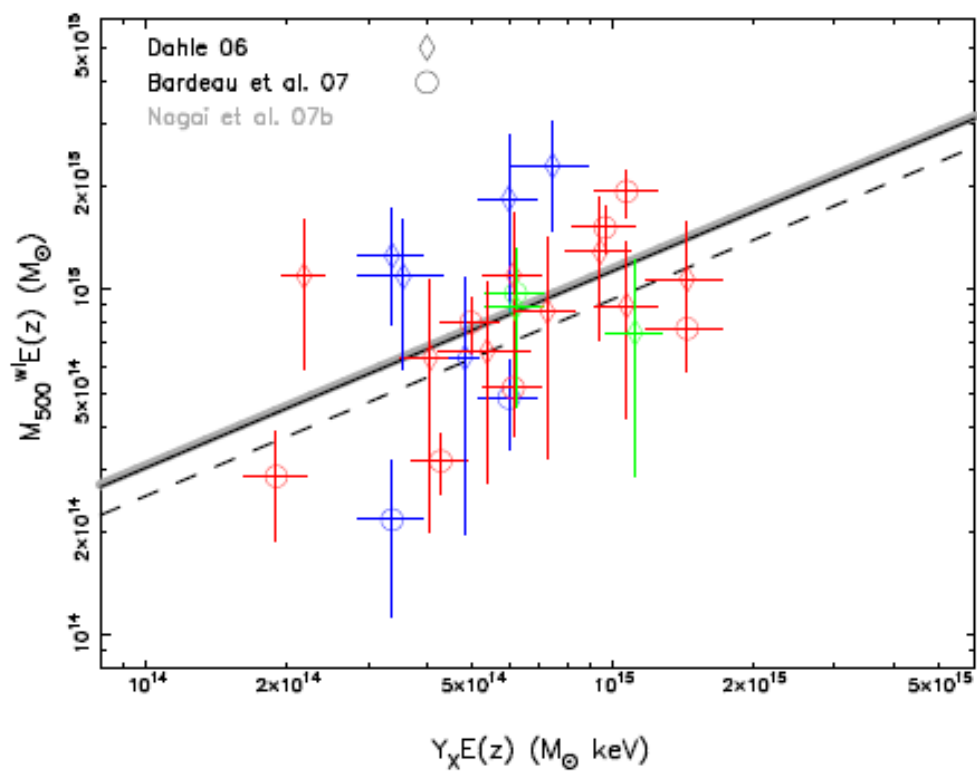
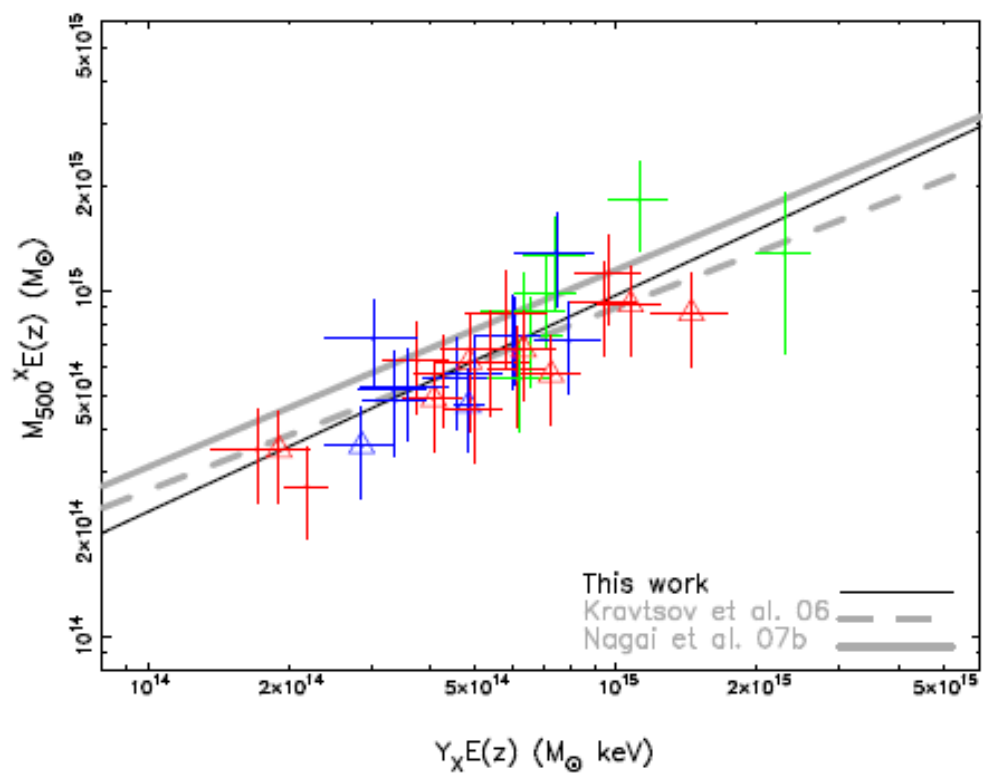
with  $Y_X (= \langle T \rangle \cdot M_{\text{gas}} = \int n_e T dV)$

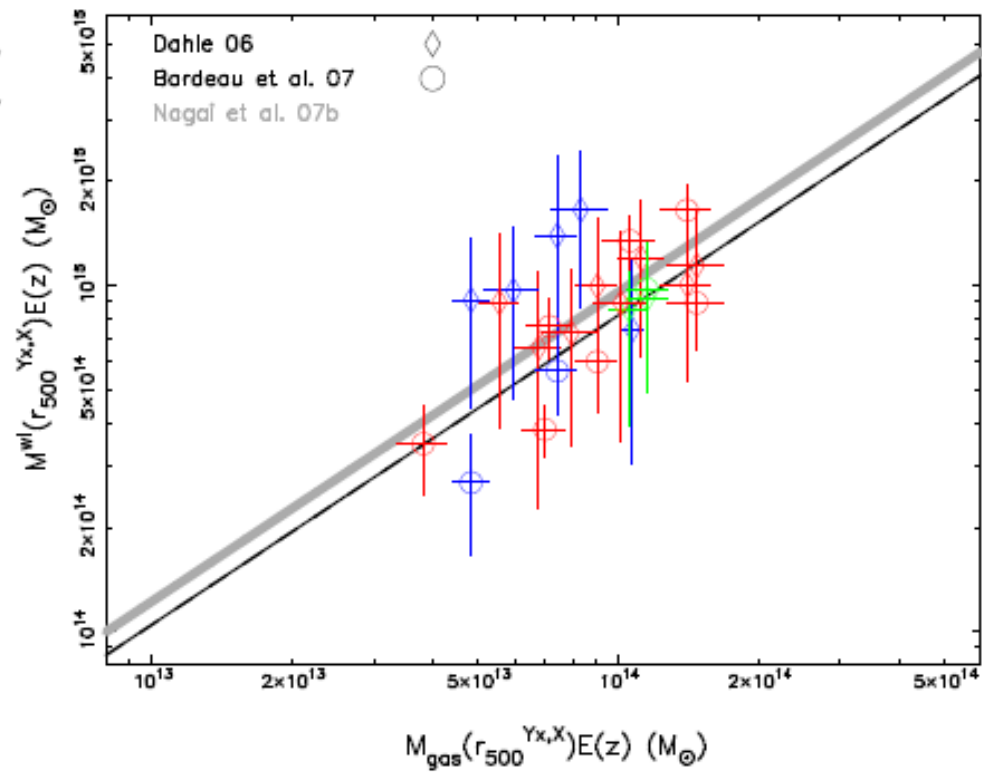
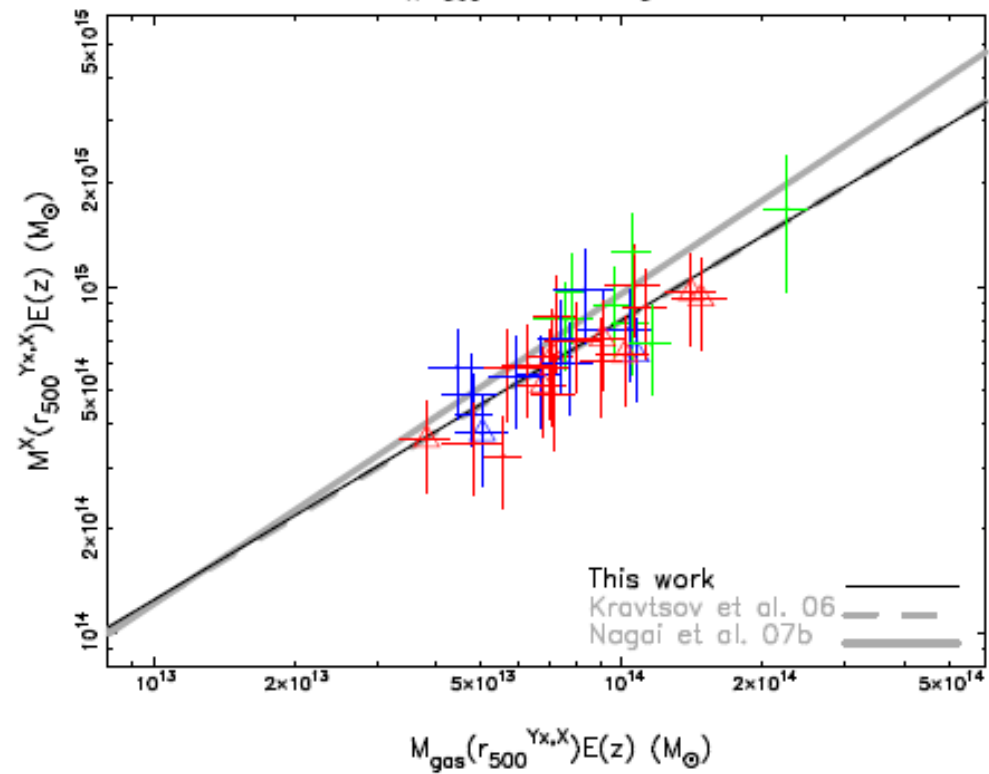
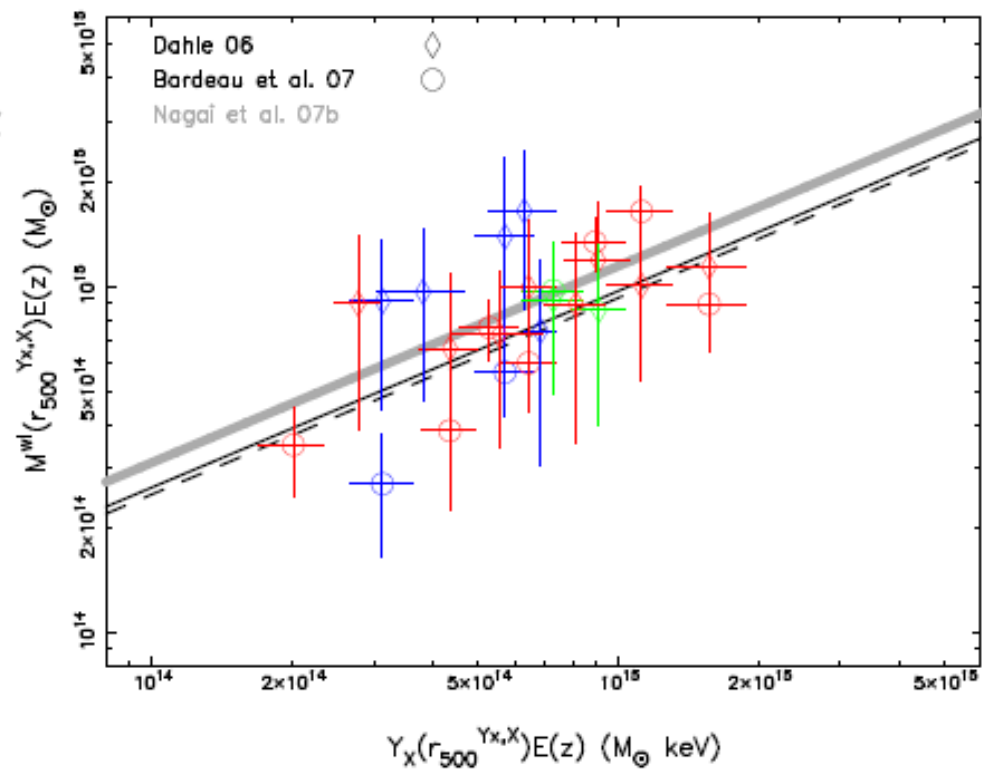
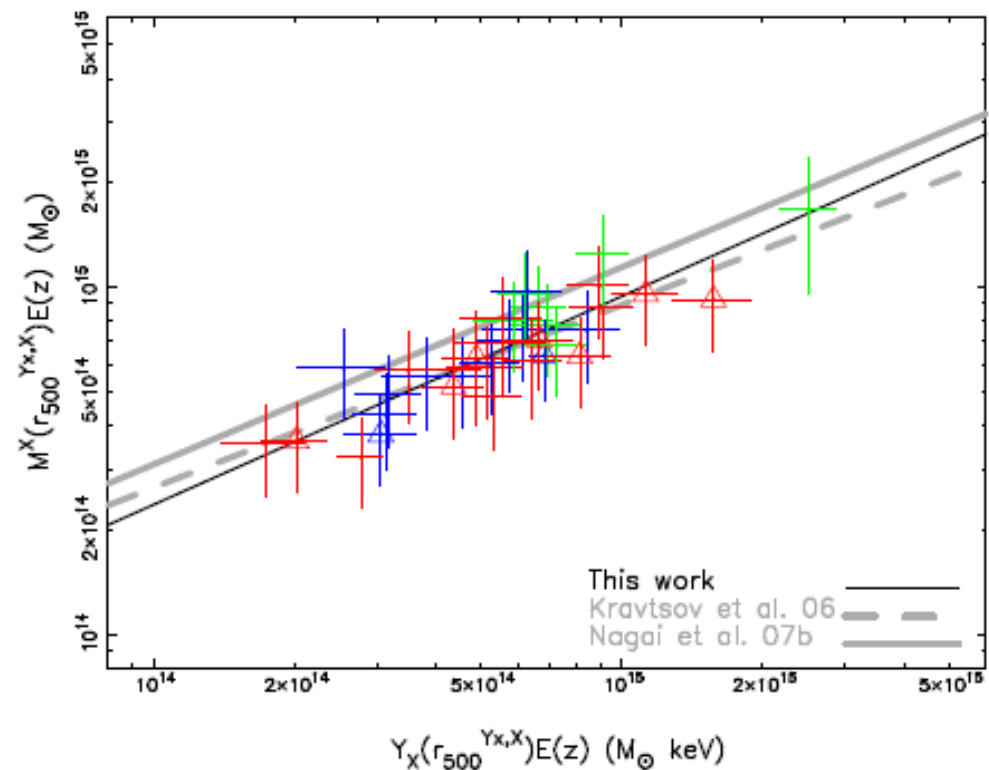
$N(M(Y_X), z)$

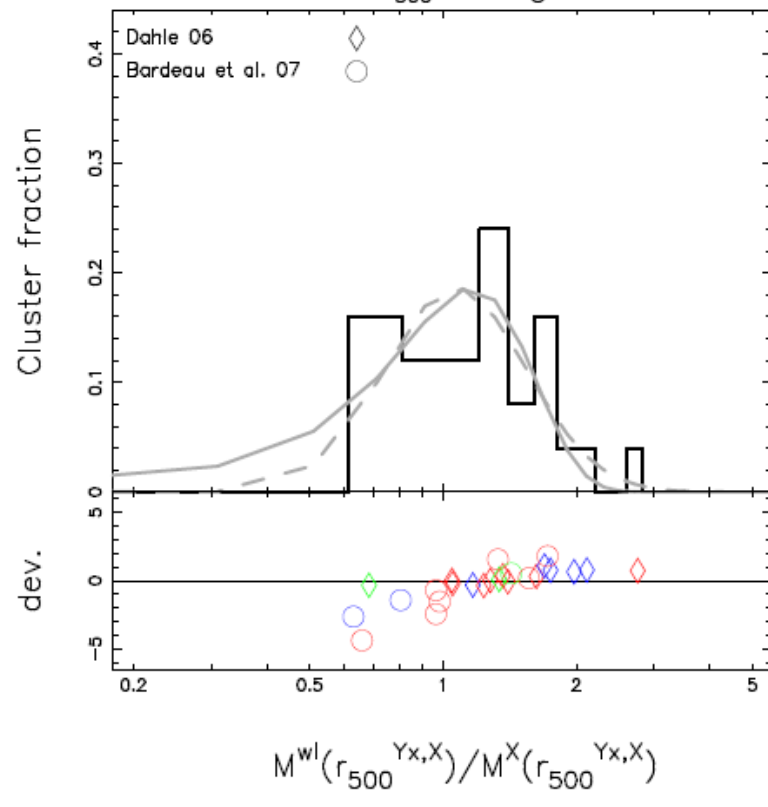
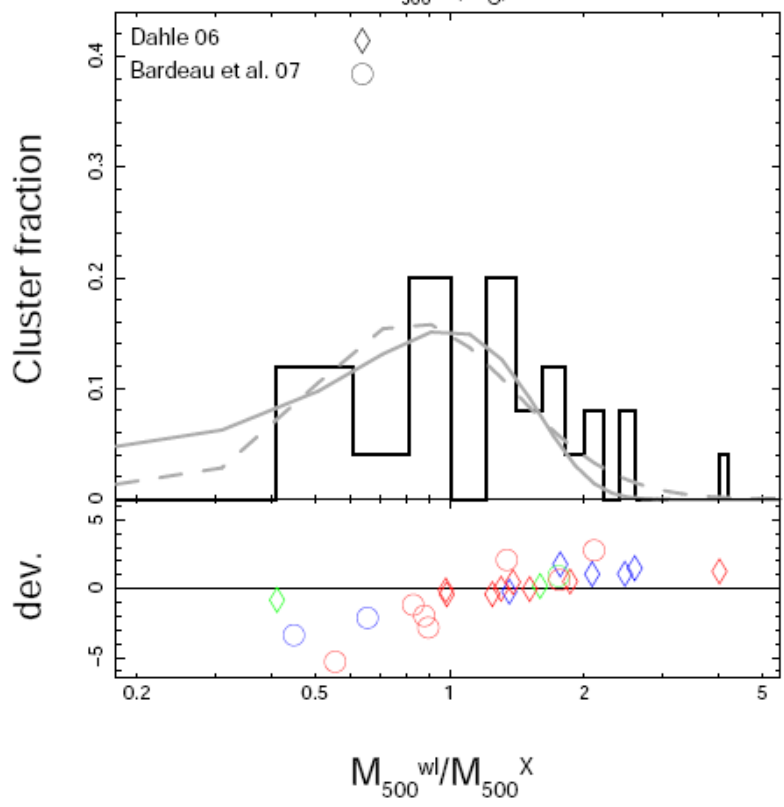
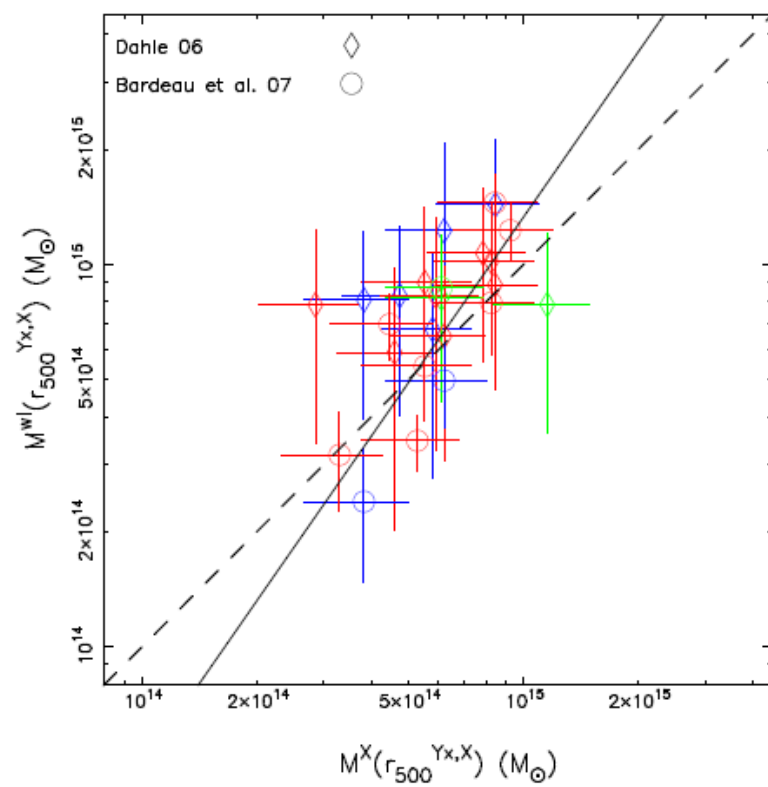
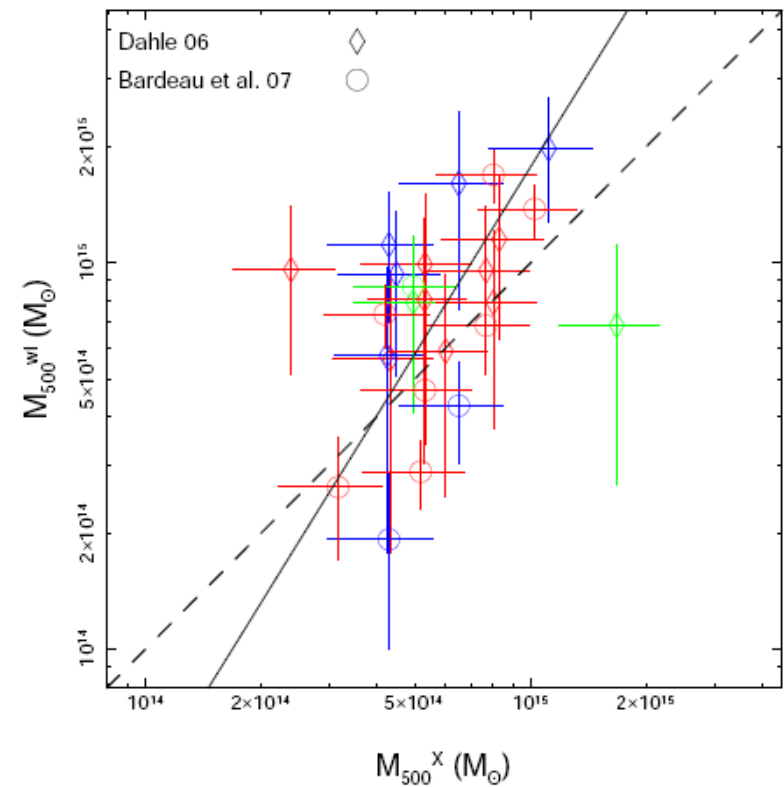


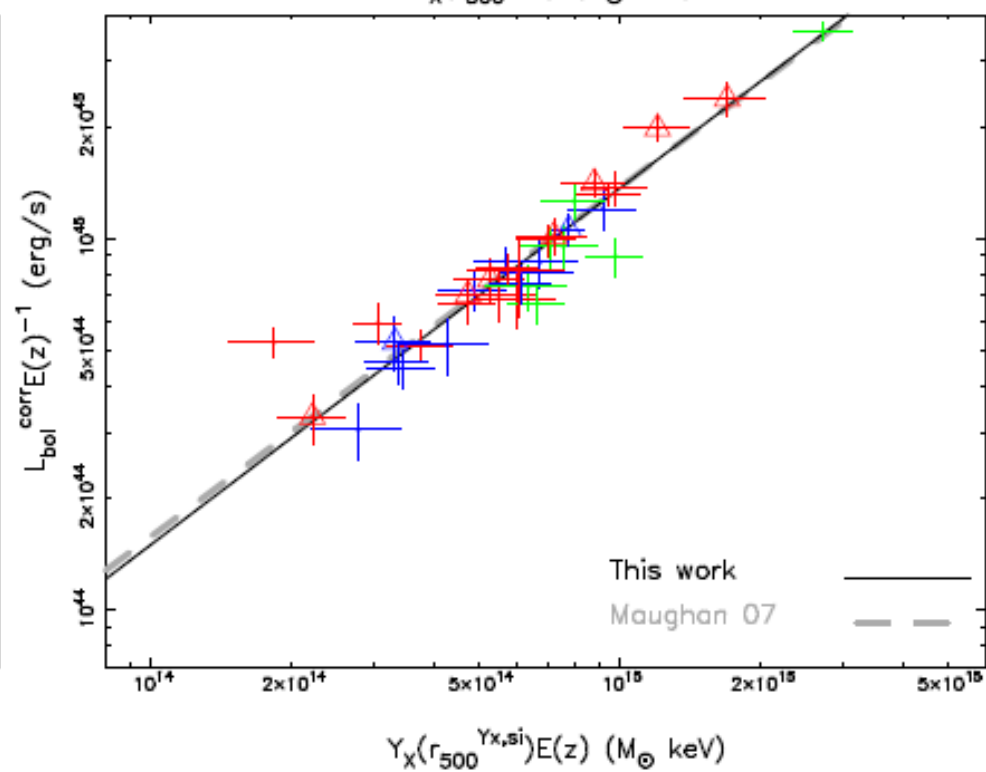
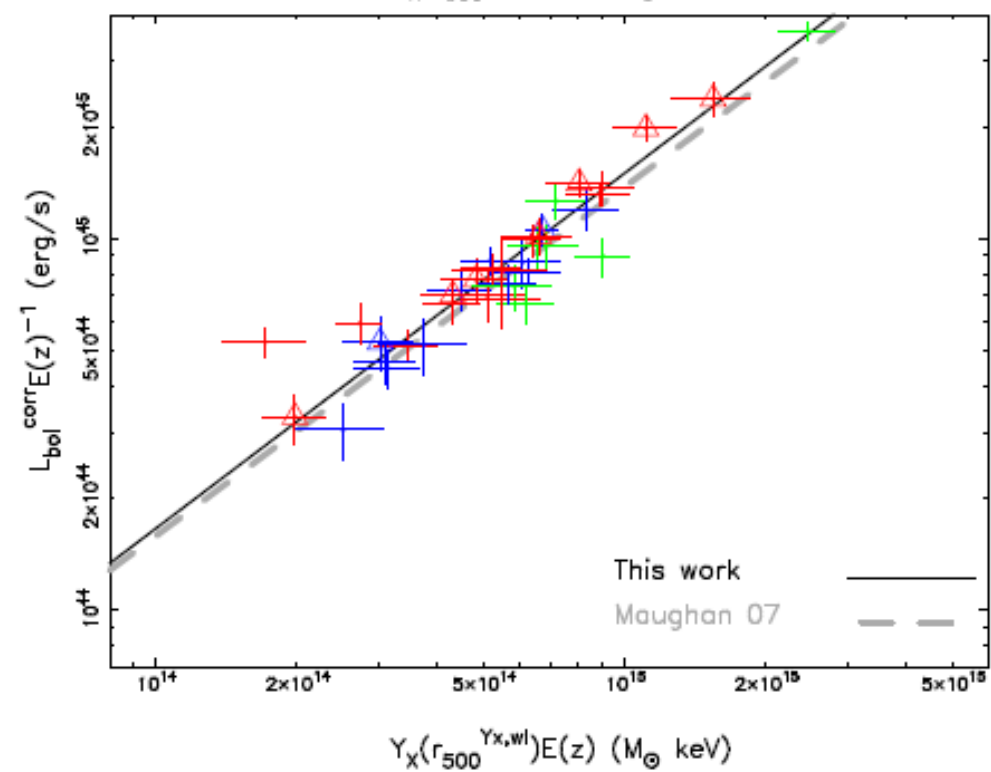
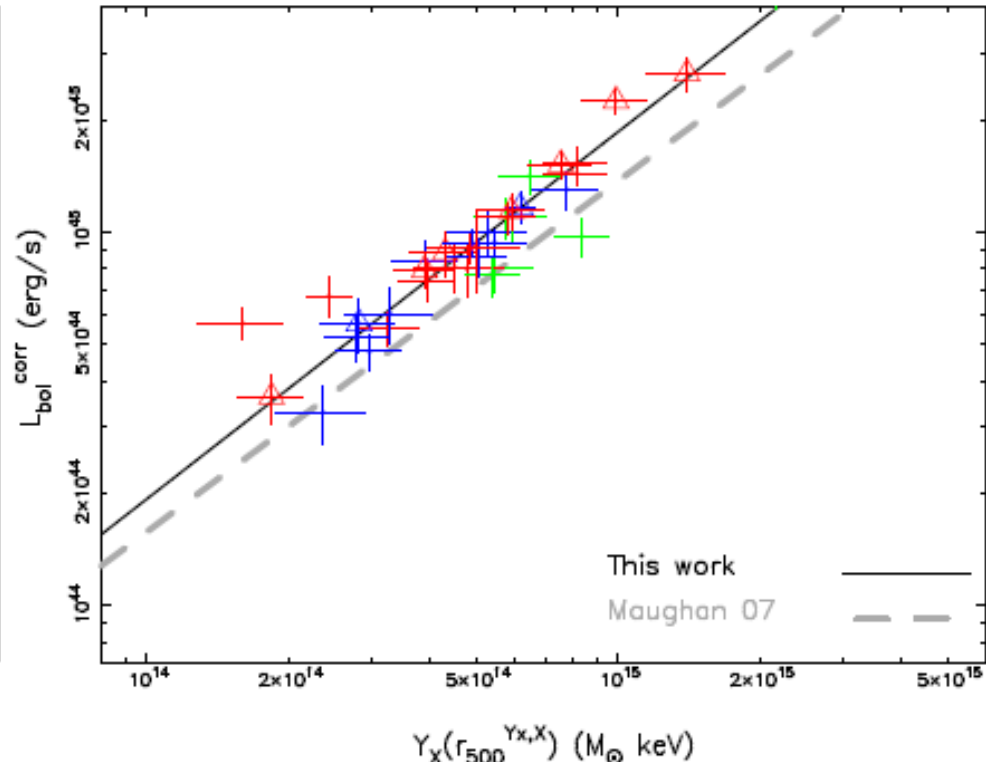
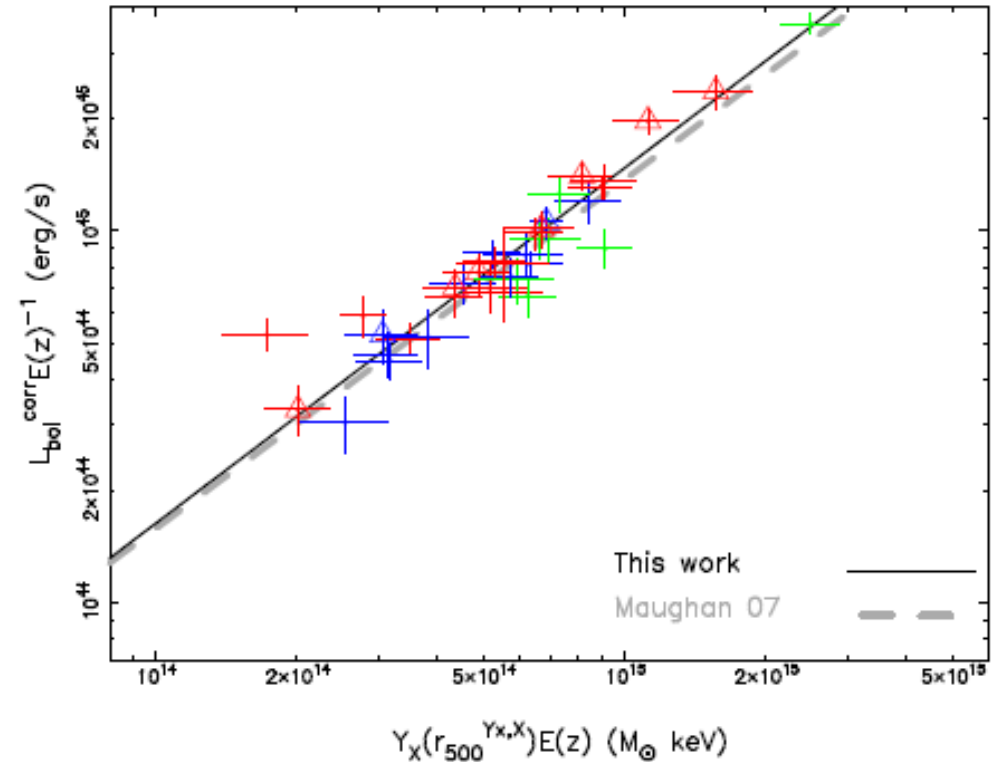
Kravtsov +06



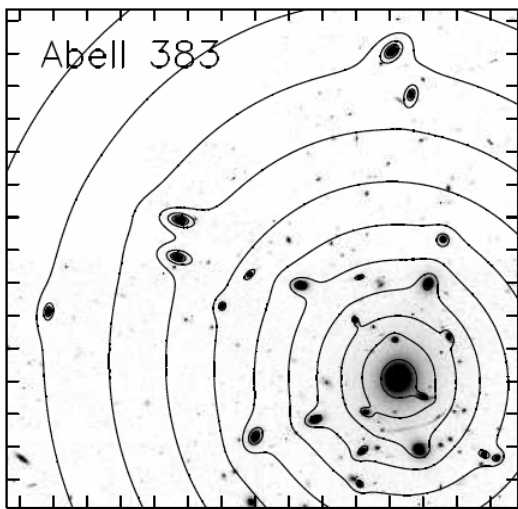




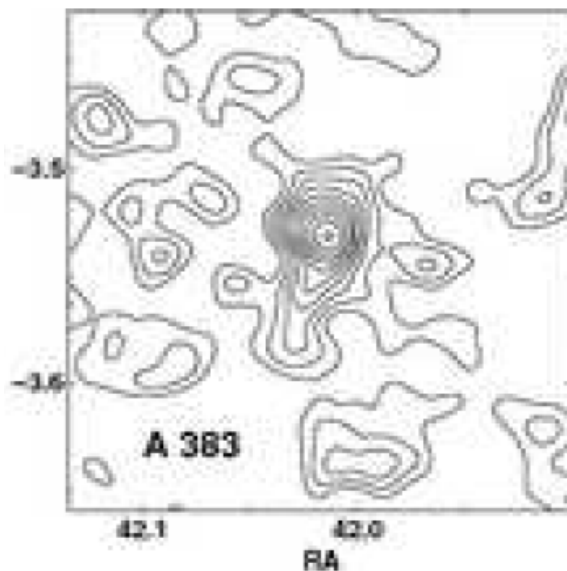








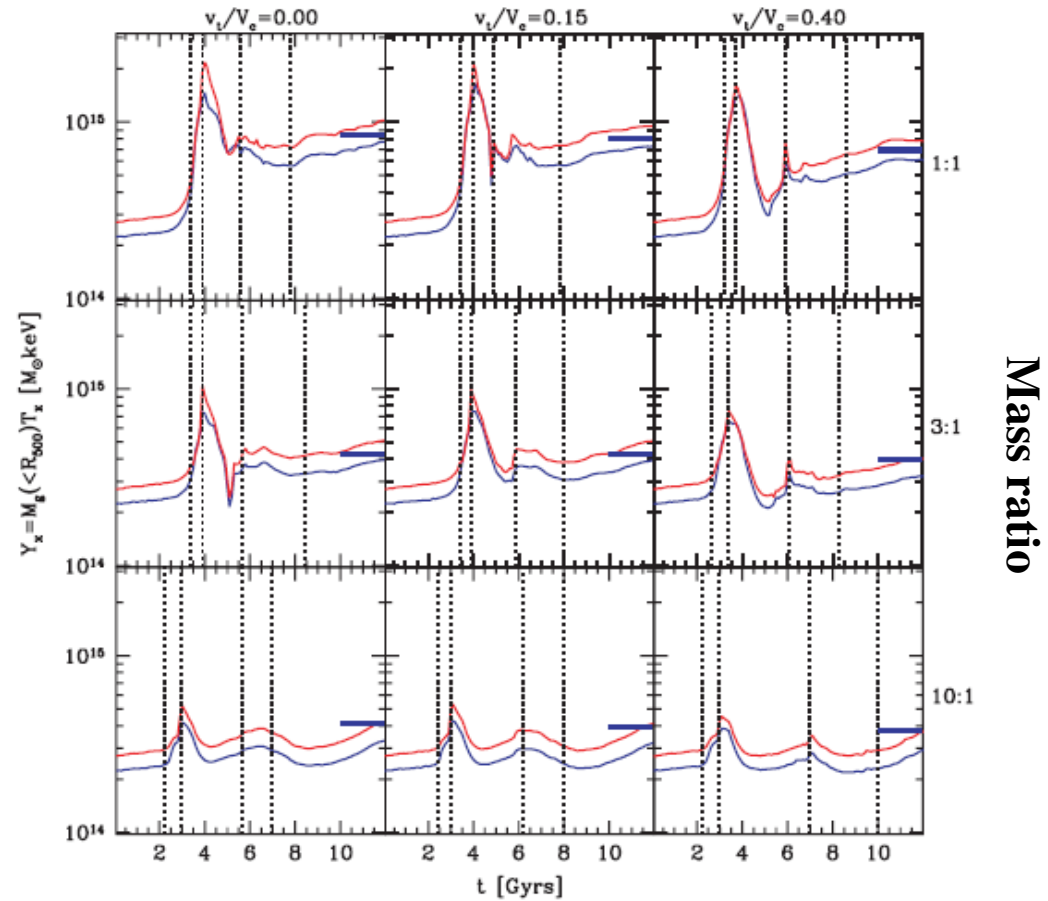
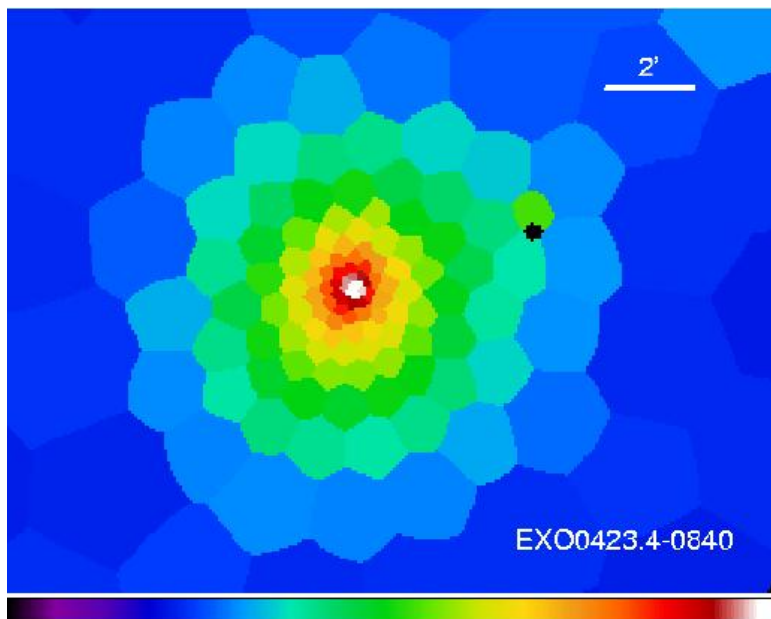
Smith +05



Bardeau +07

Kravtsov+07  
Poole+07

64 HIFLUGCS clusters:  
>100,000 cluster counts each  
>20 bins/cluster with  $\Delta T/T \sim 10\%$



Time scale: virial crossing, closest, accretion, relax

# Conclusions

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.