ACCRETION MODELS FOR BLACK HOLE EVOLUTION

Francesco Shankar

In collaboration with:

D. H. Weinberg
J. Miralda-Escude'
M. Crocce
P. Fosalba

THE OHIO STATE UNIVERSITY

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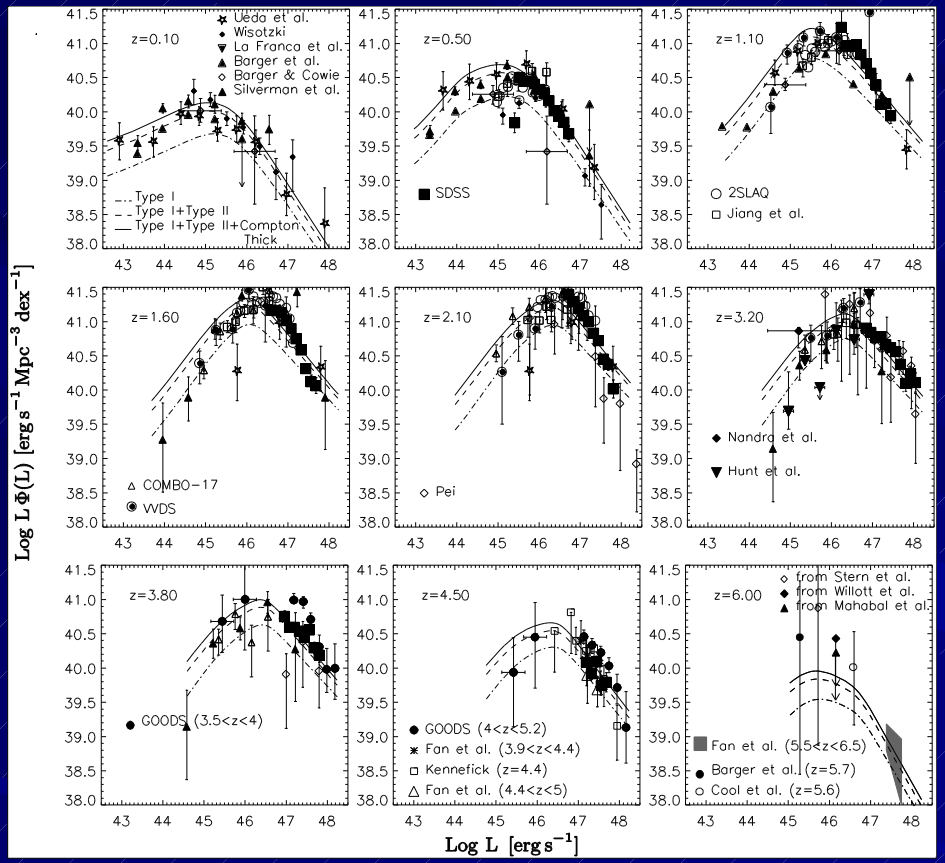
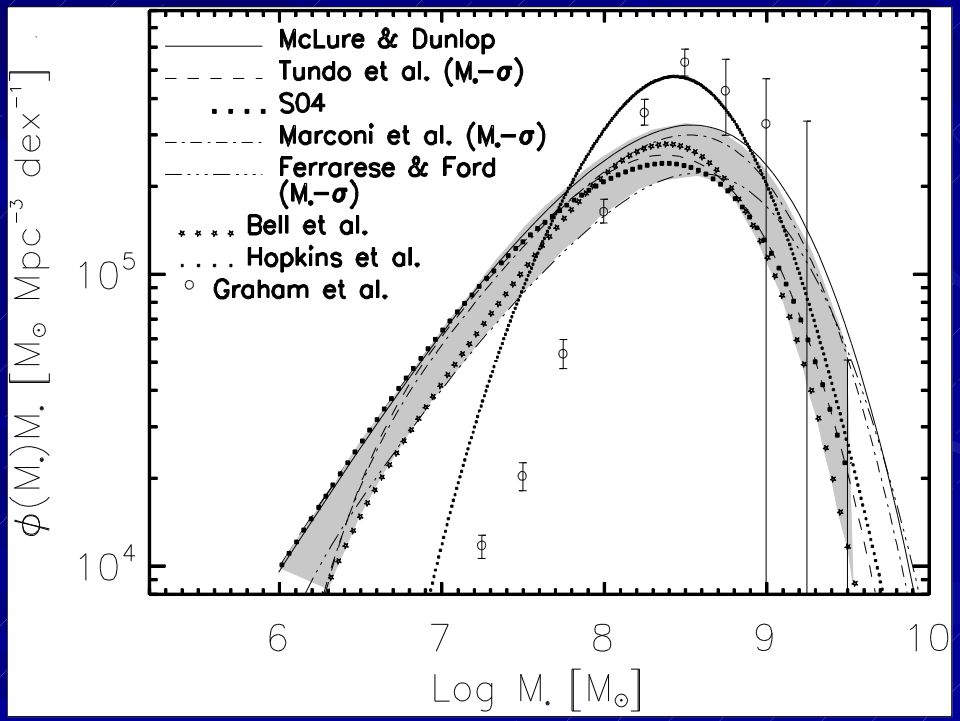
INPUT/CONSTRAINTS FOR MODELS

$$\frac{\partial F(L,t)}{\partial t} = -t_{ef}\ln(10)\frac{\partial F(M_{BH},z)}{\partial \log M_{BH}}$$

[t_{ef}~E/E]

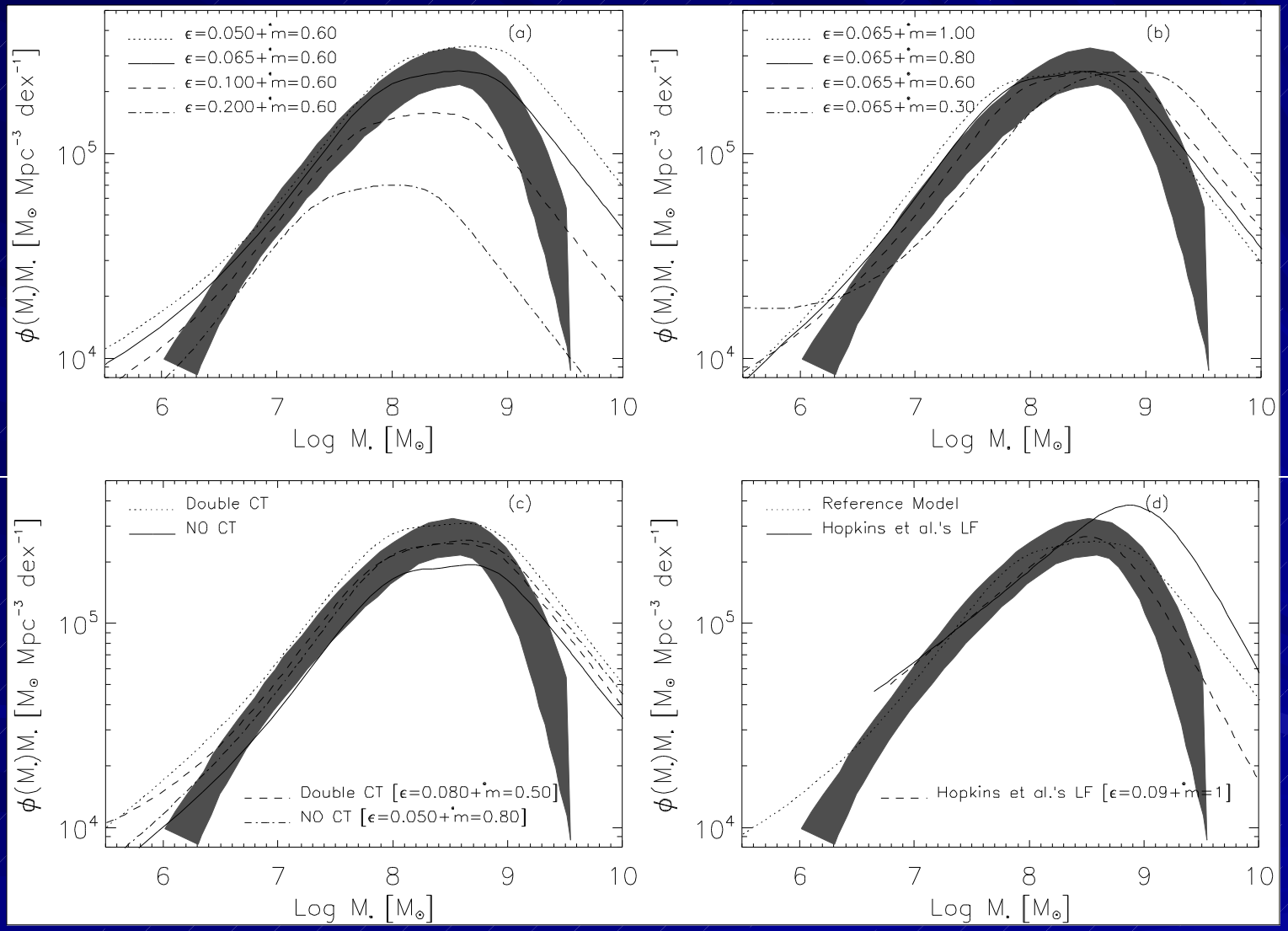


AGN LUMINOSITY FUNCTION



LOCAL BH MASS FUNCTION

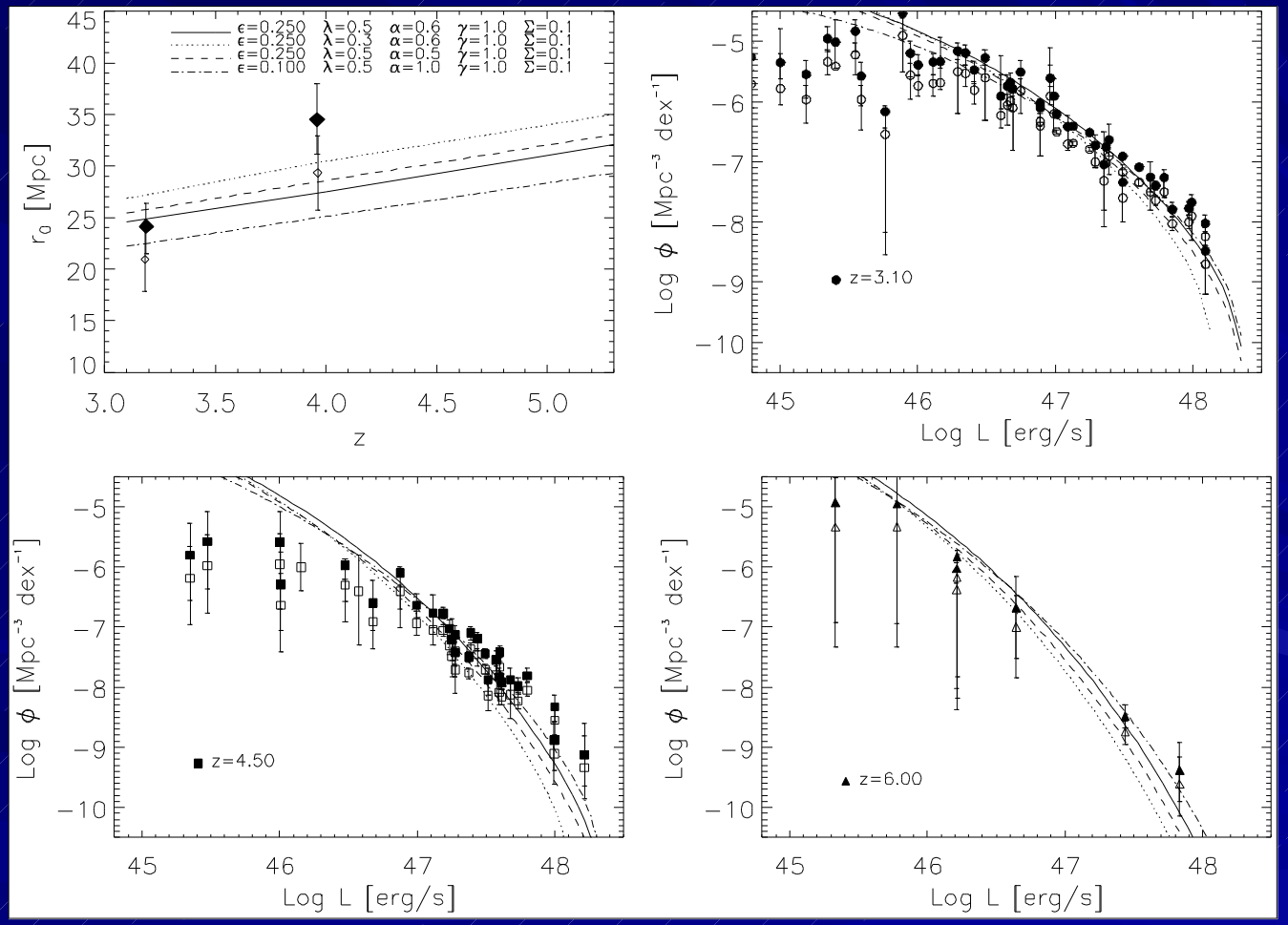
Varying the Reference Model…



Additional Constraints: AGN Clustering

$$\frac{\partial F(L,t)}{\partial t} = -t_{ef} \ln(10) \frac{\partial F(M_{BH}, z)}{\partial \log M_{BH}}$$

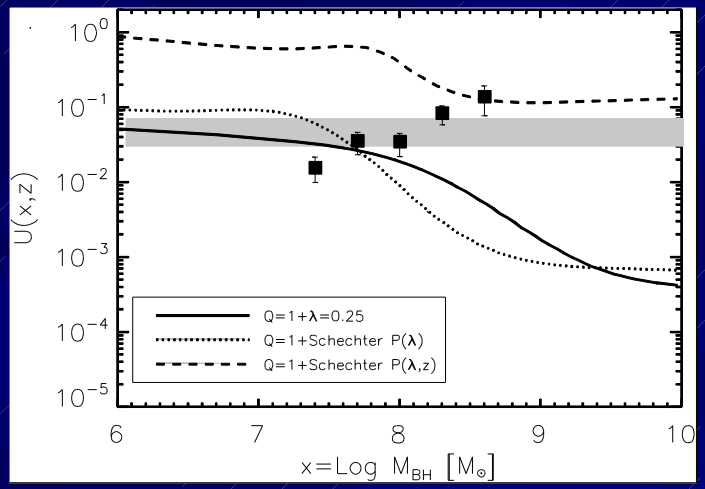
$L \; E \; EM_{BH} \sim E \; \alpha \; (M_{HALO})^{\beta}$

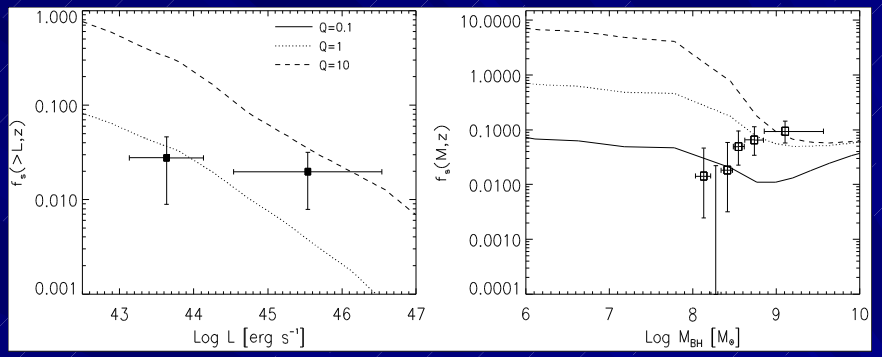


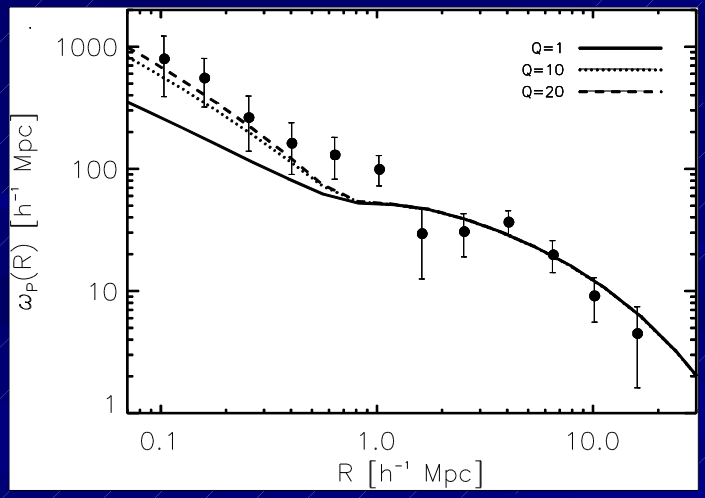
Allowing QSOs in central and satellite halos

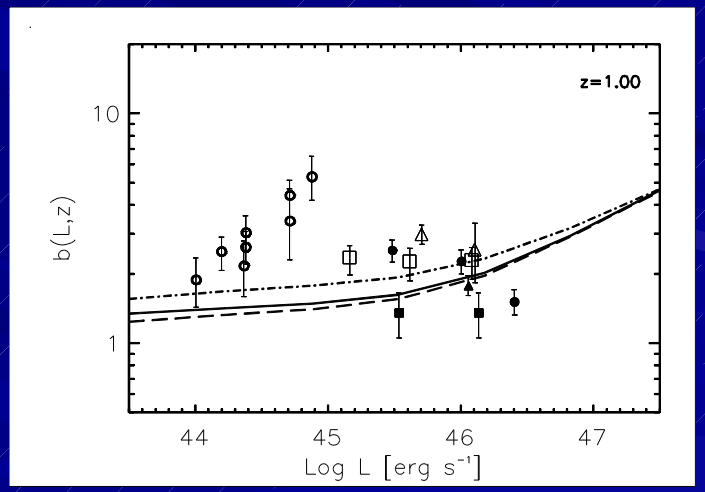
Q=fs/fc

Qxfc(M_h)+fc(M_h) ~ U(M_{bh},z)

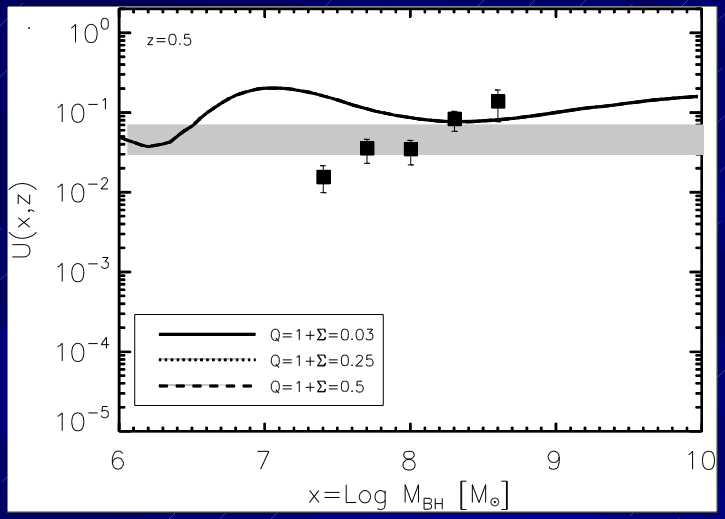


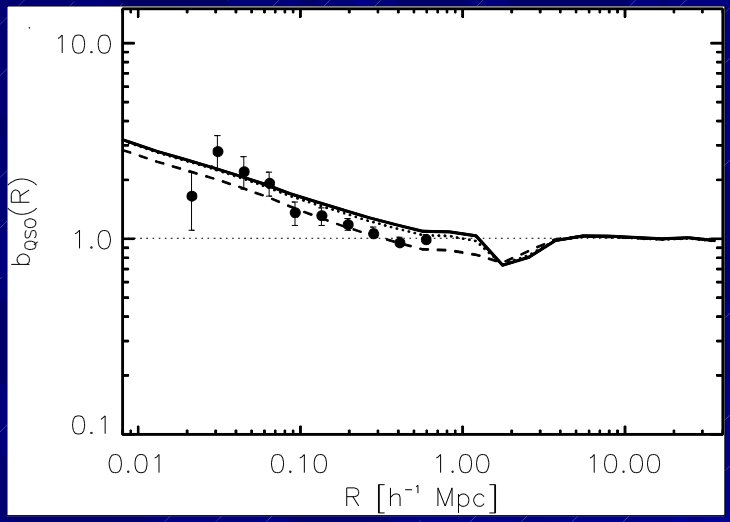


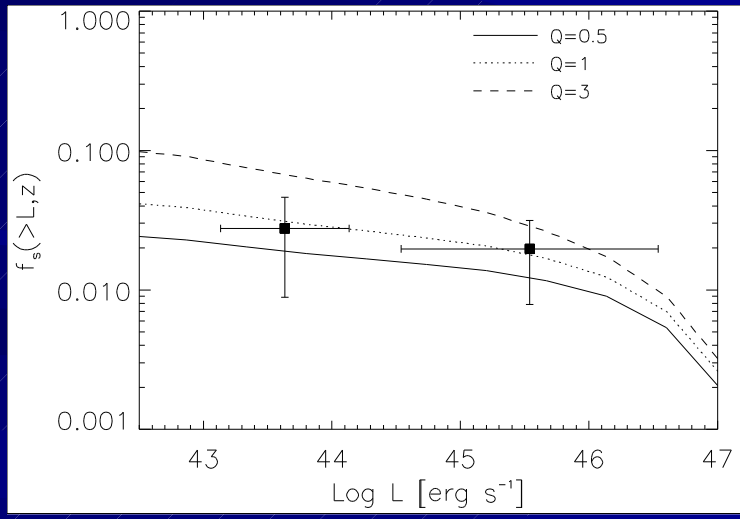


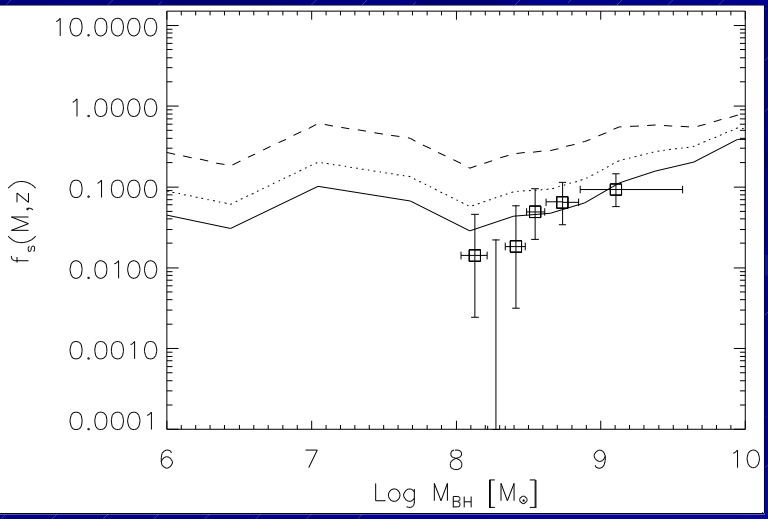


Successful Models: E(z); $E \sim (M_{bh})^{-E}$









CONCLUSIONs:

- Matching the LMF constrains mean rad. eff. And Edd. Ratio
- Further constraints from Clustering at low and high z:

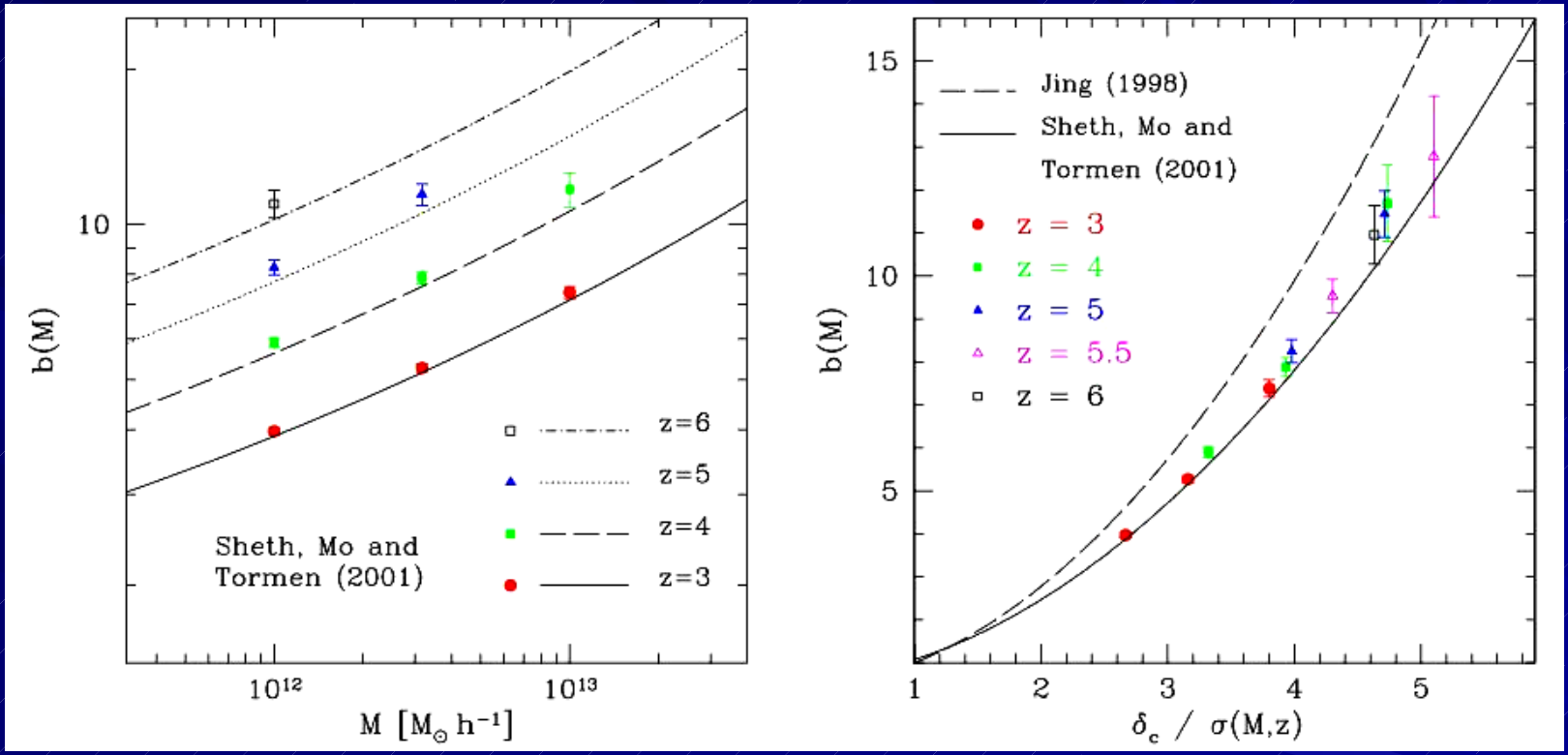
  1-high rad eff and Edd ratio at high z

  2-Edd ratio decreasing and decreasing with BH mass

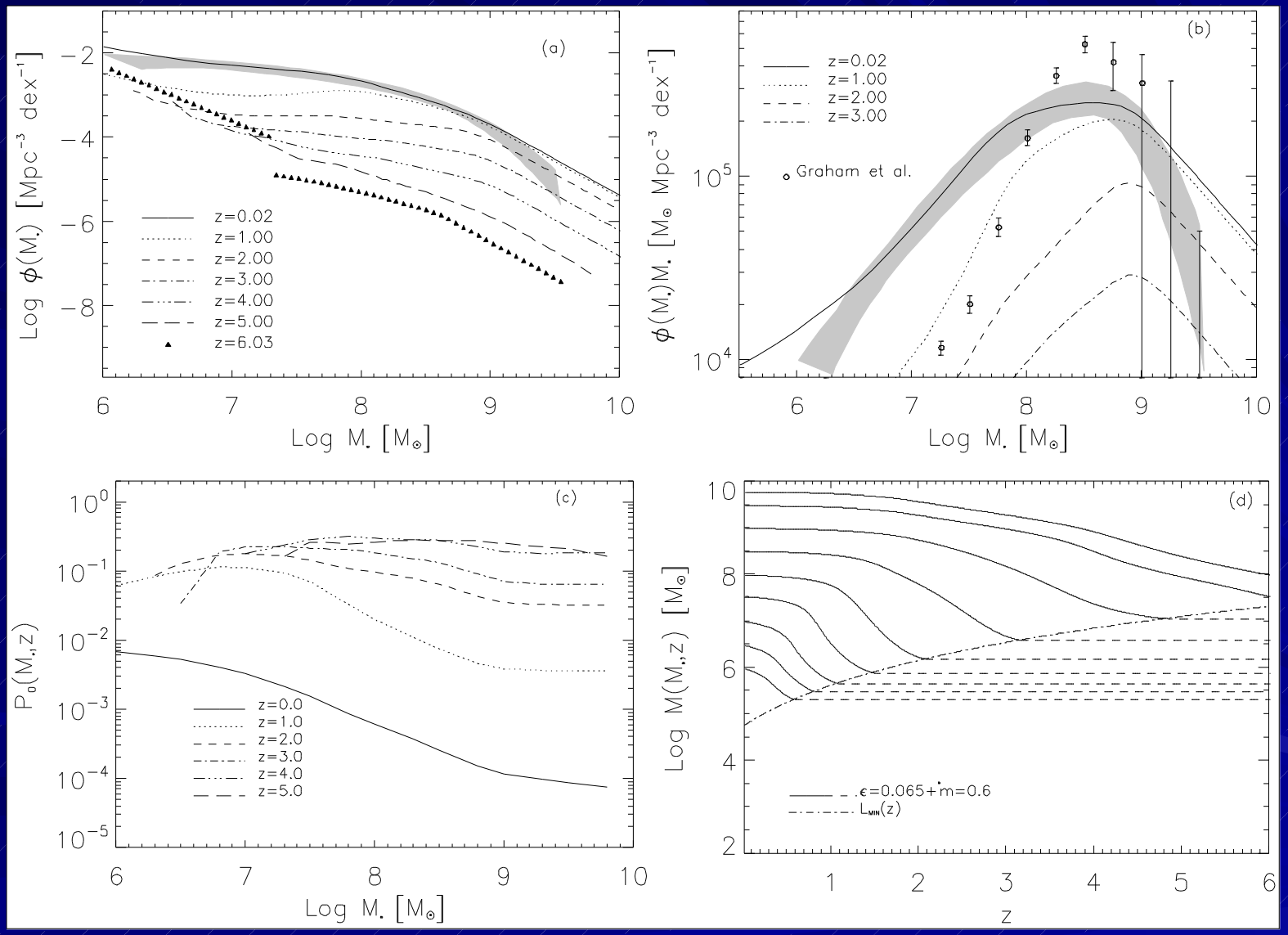
FUTURE DIRECTIONs:

- Convolve continuity Equation with BH merger rates
- Get final BH mass function at all z consistent with ALL observables
- Predict the BH mass function from SAM

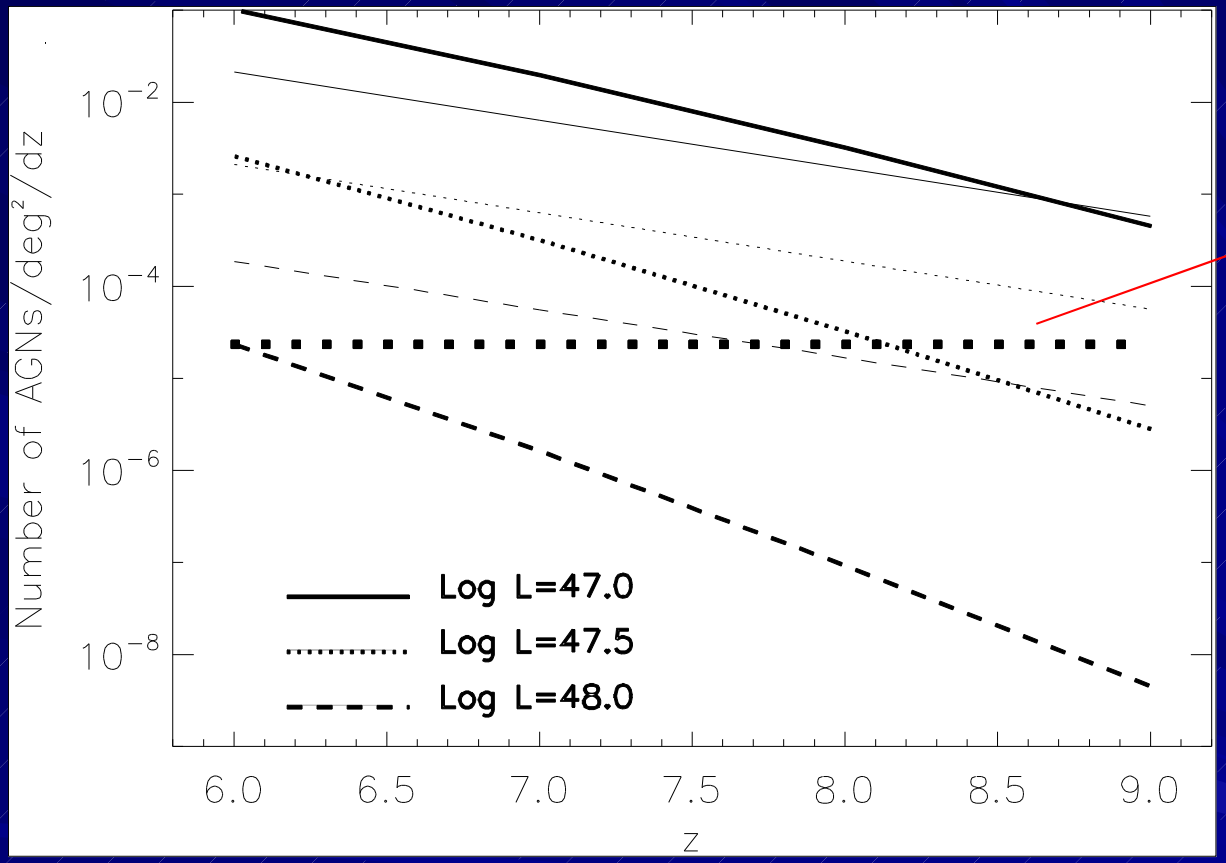
We have checked we are using the right bias....



A Reference Model



WILL WE BE ABLE TO OBSERVE z>6 QSOs?



1 QSO over the whole sky