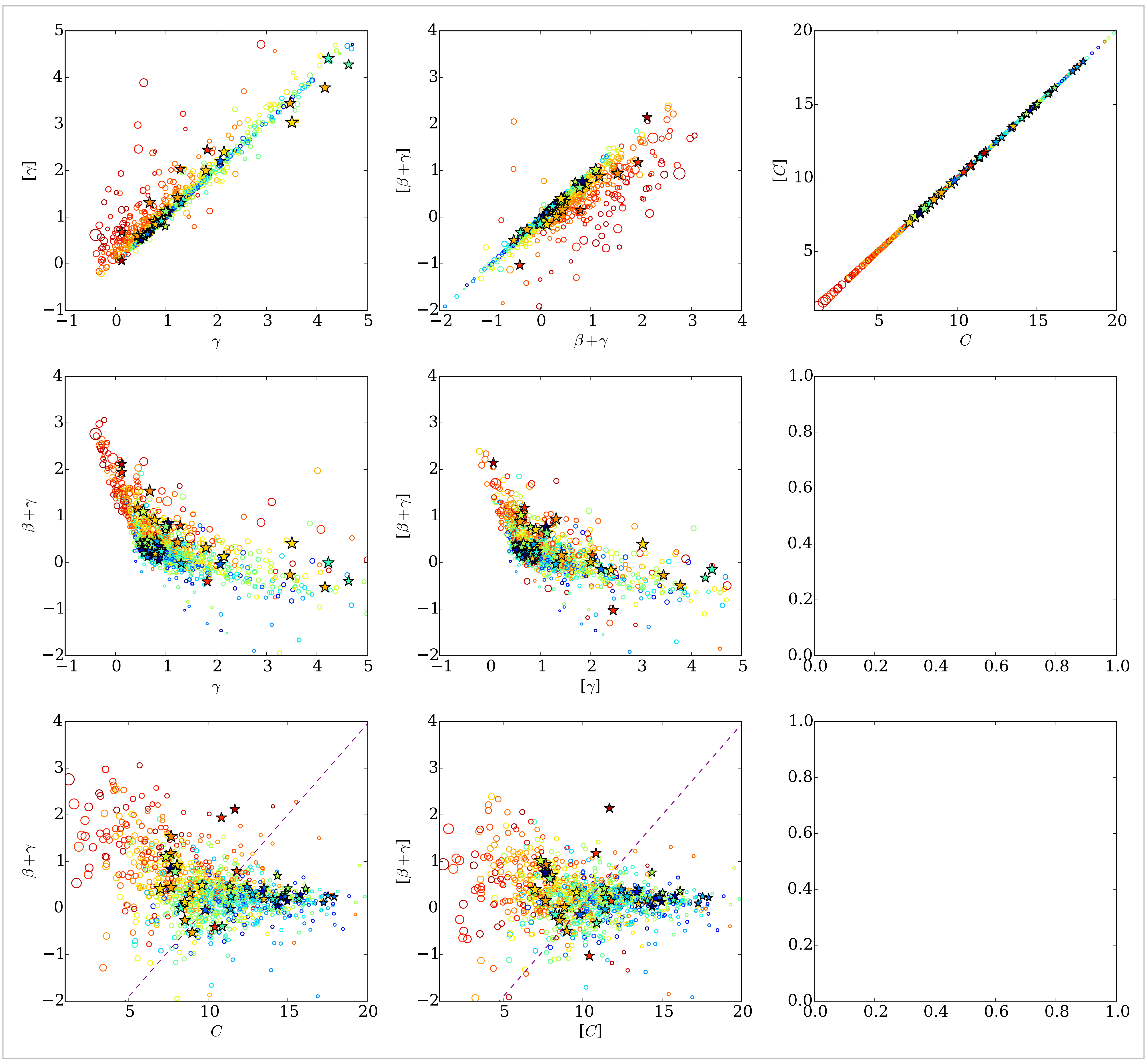
1) The effect of accreting massive sub halo on the MAH:

Method: I track the merger tree and find the mass of the most massive subhalo at accretion. I subtract its mass from the MAH since it is accreted. The corrected MAH would be the MAH disregarding the most massive sub. I have not found a way to do concentration.

Result: I show how the most massive subhalo corrected MAH fitting parameters compare to the original MAH fitting parameters. The y-axises are the corrected parameters, and the x-axises are the original. Color denotes the mass of the most mass subhalo, with redder corresponding to higher mass. The two second row panels show the distribution of halos in the gamma - beta + gamma space changes. The two bottom panels show the distribution in the beta+gamma - concentration space. In all the panels, circles are the cosmological simulation halos, and stars are the zoom-ins. The result suggests that the accretion of the most massive subhalo does contribute to the fast recent accretion, but it is not the only effect. After removing the mass contributed by the most massive subhalo, the MAH fitting parameters do vary. The effect is stronger for hosts that have more massive subhalos. However, after removing the most massive sub halo, the trend in the correlation we talk about in the paper still exist, but a lot weaker.



2) The effect of the randomness of the detailed jumps in MAHs on the MAH fitting parameters:

Method: I keep using the original MAH, but fit the MAH from a slightly different redshift. I choose z=0.1. The part of MAH z<0.1 is ignored in the fitting procedure.

Result: The plots are made as 1), and are shown below. Shifting the endpoint of the MAH does change the fitting parameters for MAH, but the changes is rather random. A small tendency that hosts with more massive subhalos is affected more. I speculate that this is because more massive subhalos are accreted more recently, shifting the endpoint of MAH may miss the time when they are accreted. Overall, the effect does not change our analysis in the paper.

halo_params_compare_z0.1.pdf
3.0 MB