NEW CODE COMPARISON RESULTS

We present in this short note new results from our code comparison study. In addition to the six previously tested codes in [1] we study the TreePM code from Martin White [2], the TreePM code GADGET-II from Volker Springel [3], and the particle-mesh code PMM from Hy Trac [4]. We restrict our studies on the large ΛCDM box and a subset of the measurements carried out in [1]. First we compare the power spectrum calculated from the particles, shown in Figure 1. The upper panel shows the residuals with respect to the original GADGET code [5]. The PMM code is in very good agreement with the MC^2 result, which is another pure particle-mesh code. GADGET-II and TreePM are in agreement with GADGET to better than 10%. Both codes have less power on small scales than the original GADGET code. As we discussed in [1] the high power on small scales in GADGET might be due to a not small enough time step. The results for the mass function shown in Figure 2 are very satisfying. Again, PPM is in very good agreement with MC^2. Both GADGET-II and TreePM agree with GADGET within 5% over most of the mass range. Last, we added the TreePM results to the comparison of the correlation function (TreePM is called WHITE in this plot). Similar to the power spectrum, TreePM is slightly lower on small scales compared to GADGET.

References

[1] K. Heitmann, P.M. Ricker, M.S. Warren, and S. Habib, ApJS, 160, 28 (2005).

[2] M. White, ApJS, 579, 16 (2002).

[3] V. Springel, arXiv:astro-ph/0505010.

[4] H. Trac and U.-L. Pen, astro-ph/0402444.

[5] V. Springel, N. Yoshida and S. D. M. White, New Astron. **6**, 79 (2001).

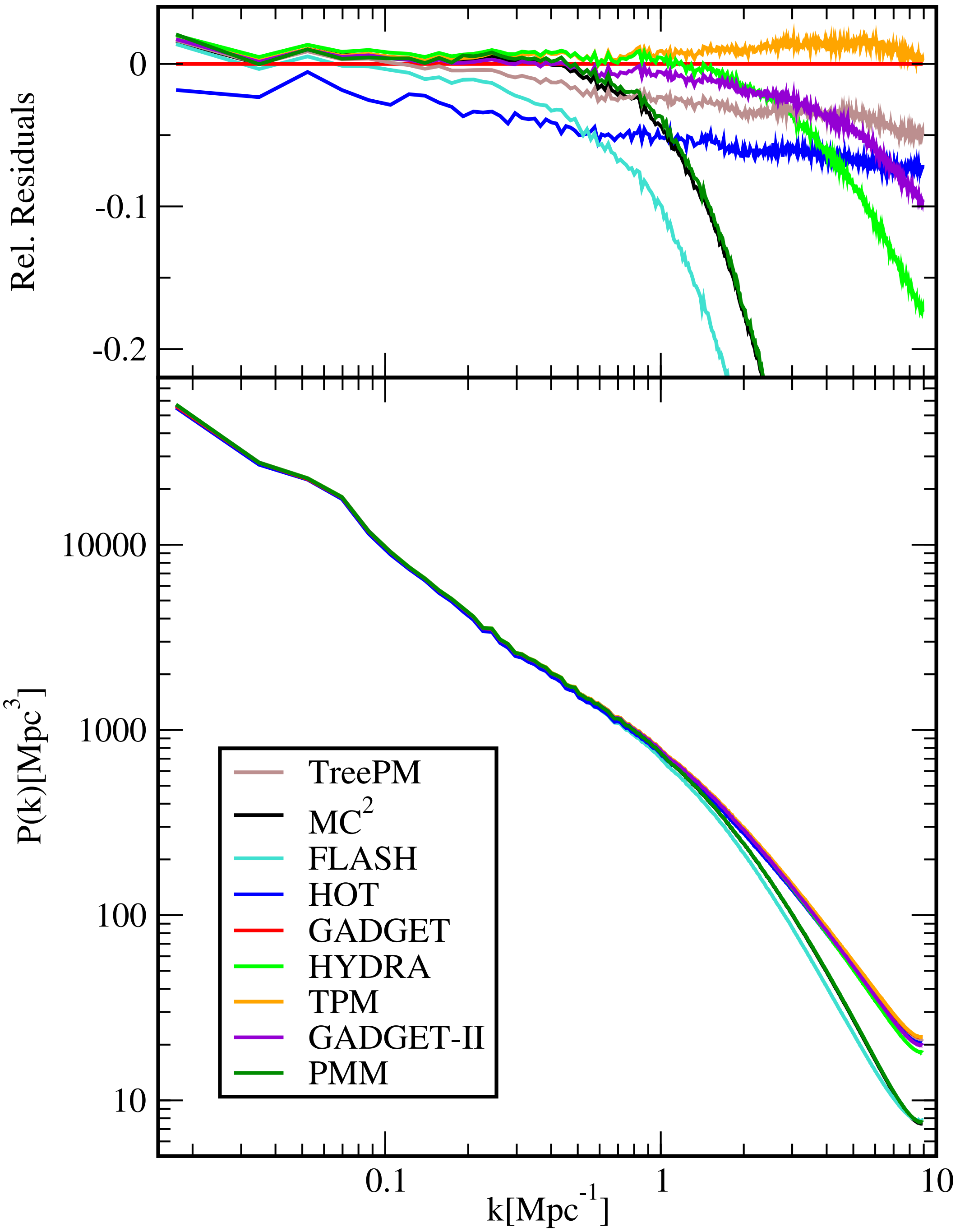

Figure 1: The particle power spectrum measured for all nine codes. GADGET's power spectrum is in general higher than the other high resolution codes. The two PM codes are in excellent agreement.

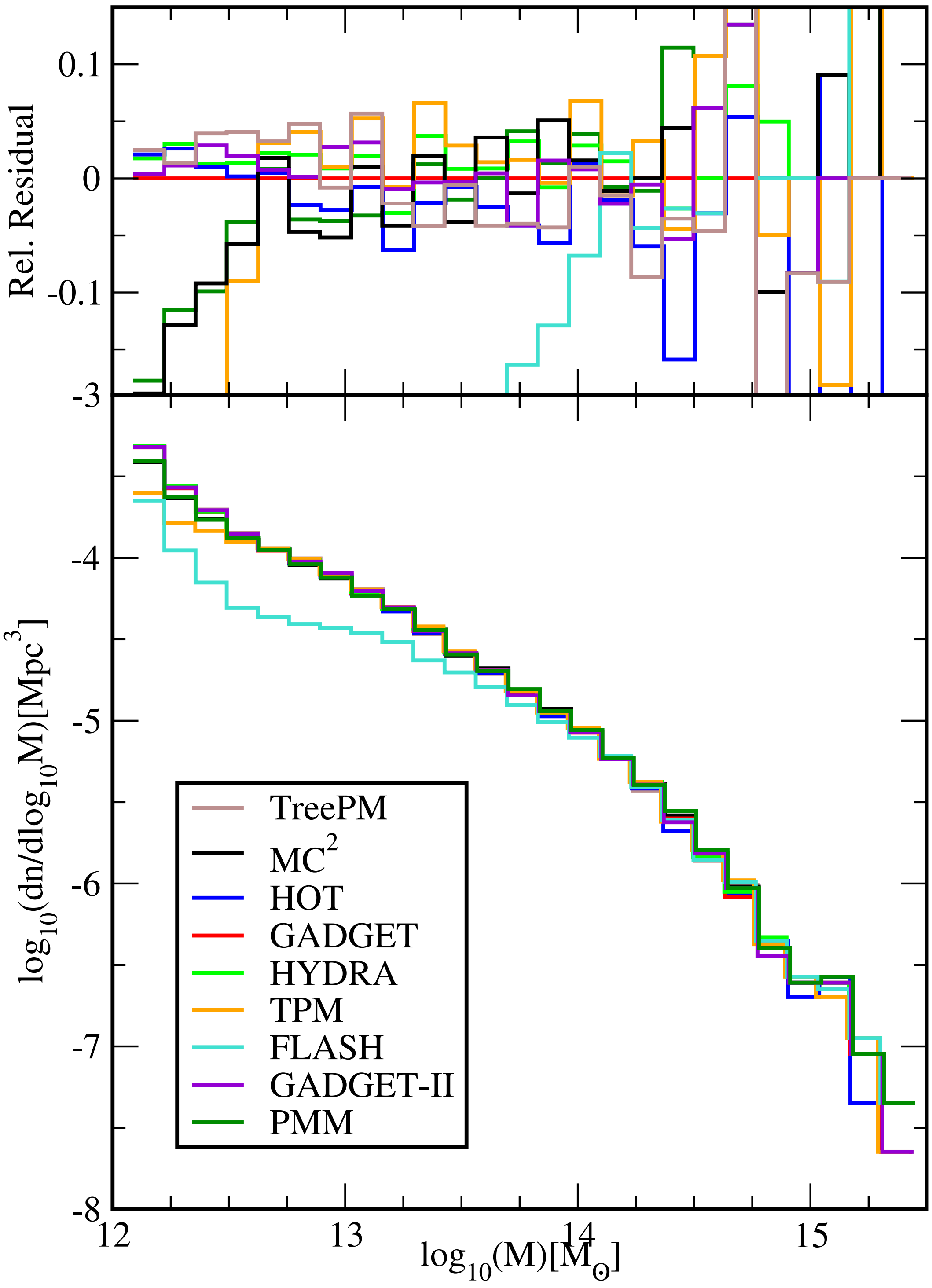

Figure 2: The mass function measured from all nine codes. Halos were identified with a FoF halo finder with linking length $b = 0.2$.

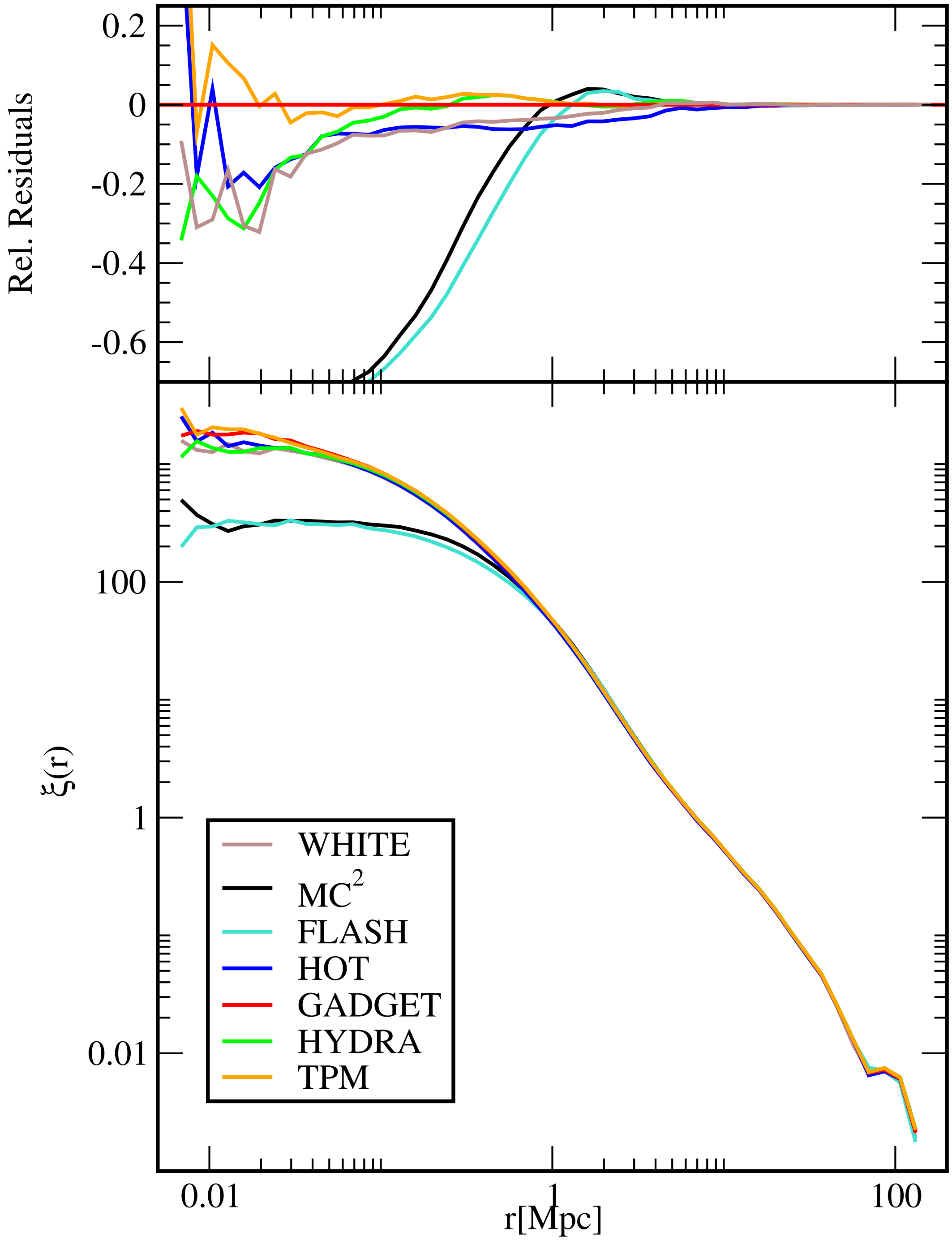

Figure 3: The correlation function measured from the particles for seven codes. As for the power spectrum, the GADGET result is slightly higher on small scales.