Lensing smoothing of BAO wiggles

Enea Di Dio[a,b]

[a]INAF - Osservatorio Astronomico di Trieste, Via G. B. Tiepolo 11, I-34143 Trieste, Italy
[b]INFN, Sezione di Trieste, Via Valerio 2, I-34127 Trieste, Italy

E-mail: enea.didio@oats.inaf.it

Abstract. We study non-perturbatively the effect of the deflection angle on the BAO wiggles of the matter power spectrum in real space. We show that from redshift $z \sim 2$ this introduces a dispersion of roughly 1 Mpc at BAO scale, which corresponds approximately to a 1% effect. The lensing effect induced by the deflection angle, which is completely geometrical and survey independent, smears out the BAO wiggles. The effect on the power spectrum amplitude at BAO scale is about 0.1% for $z \sim 2$ and 0.2% for $z \sim 4$. We compare the smoothing effects induced by the lensing potential and non-linear structure formation, showing that the two effects become comparable at $z \sim 4$, while the lensing effect dominates for sources at higher redshifts. We note that this effect is not accounted through BAO reconstruction techniques.