1 Equation 24 of Valageas et al.

$$P_k(\ell) \quad = \quad 2\pi \int_0^{\chi_s} d\chi \frac{w}{\mathcal{D}} P(\ell/\mathcal{D}; z) \tag{1}$$

where

$$w(\chi, \chi_s) = \frac{3\Omega_m H_0^2 \mathcal{D}(\chi)\mathcal{D}(\chi_s - \chi)}{2c^2 \mathcal{D}(\chi_s)}(1+z). \tag{2}$$

Therefore,

$$P_k(\ell) = 2\pi \left(\frac{9\Omega_m^2 H_0^4}{4c^4}\right) \int_0^{\chi_s} \left(\frac{\mathcal{D}(\chi_s - \chi)}{\mathcal{D}(\chi_s)}(1+z)\right)^2 P(\ell/\mathcal{D}; z) d\chi \tag{3}$$

Integral over redshift

$$P_k(\ell) = 2\pi \left(\frac{9\Omega_m^2 H_0^3}{4c^3}\right) \int_0^{z_s} \left(\frac{\mathcal{D}(\chi_s - \chi)}{\mathcal{D}(\chi_s)}(1+z)\right)^2 P(\ell/\mathcal{D}; z) \frac{dz}{E(z)} \tag{4}$$

where $E(z) = H(z)/H_0$.

2 Eq. 20 of Pourtsidou et al.

$$C_L = \frac{9\Omega_m^2}{L(L+1)} \left(\frac{H_0}{c}\right)^3 \int_0^{z_s} (...) \tag{5}$$

P14 have plotted $L(L+1)C_L/2\pi$. Therefore we have

$$C_L = \frac{9\Omega_m^2}{2\pi} \left(\frac{H_0}{c}\right)^3 \int_0^{z_s} (...) \tag{6}$$

in the plot.

To compare the result with Valageas et al. we multiply the above expression with $(2\pi)^2/4$. Therefore, P14's expression becomes

$$C_L = \frac{2\pi 9\Omega_m^2}{4} \left(\frac{H_0}{c}\right)^3 \int_0^{z_s} dz P(k,z) W(z)^2 / E(z) \tag{7}$$

Notice that C_L is dimensionless.

$$P(k,z) \quad : \quad Mpc^3 \tag{8}$$

$$\frac{H_0}{c} \quad : \quad \frac{1}{Mpc^3} \tag{9}$$

Even if Mpc/h units are used, h cancels.

Ignore this paragraph: But we are going to multiply C_L with L^2. There we need to take the h factors into account. I did a *Mpc* word search in P14 and saw that they have used Mpc/h everywhere. So I am going to assume that they have taken h/Mpc units in L also. Okay. I just realized that L is dimensionless. So there is no problem. The plotted C_L is still dimensionless. The same holds for Valageas's plot. I don't have to worry about the h factors. They just cancel. Only two parts contain the h factors: H_0/c and $P(k, z)$ and they cancel. I didn't realise this earlier.

Well, now we can directly compare (7) and (4) without any issues. So, what we finally plot to compare with Valageas's plot is P14's plotted curve $\times(L^2 \times 2\pi) \times ((2\pi)^2/4)$. That's what I have done in "Plot from Pourtsidou et al. 2014" section of the code located in this file.

`Directory: C2SNR/Pow_spec_test_code/All_tests/Comparison_of_angpowspec_with_valageas/Compare_ang_pow_spec/comparison_of_angpowspec_with_valageas_and_pourtsidou.py`