$_{\mathrm{OCL}} = \varepsilon_g^{\mathrm{qp}} - \varepsilon_g$ calculated by OCL via local density approximation (LDA) (diamonds) is almost entirely due to the classical polarization energy Σ_{pol} (solid line) for the full range of sizes. Consequently, the fact that the quasiparticle gap $\varepsilon_g^{\mathrm{qp}}$ is different from the single-particle gap ε_g does not constitute a criticism of the latter, as OCL argue, but is merely a comparison of physically distinct quantities.

While OCL included surface polarization effects in the calculation of $\varepsilon_g^{\mathrm{qp}}$, they neglected them in the calculation of the optical gap $\varepsilon_g^{\mathrm{op}}$. Indeed, the total electron-hole interaction energy is $E_{\mathrm{Co}\ 1}^{eh} + E_{\mathrm{pol}}^{eh}$, where $E_{\mathrm{pol}}^{eh} \simeq (e^2/R)\,(1/\epsilon_{\mathrm{o}} - 1/\epsilon_{\mathrm{in}})$ describes the interaction between the electron and the surface polarization charge produced by the hole, and between the hole and the surface polarization charge produced by the electron [2,3]. Conventional dielectric functions, such as the one used by OCL, do not