form of the imaginary part.

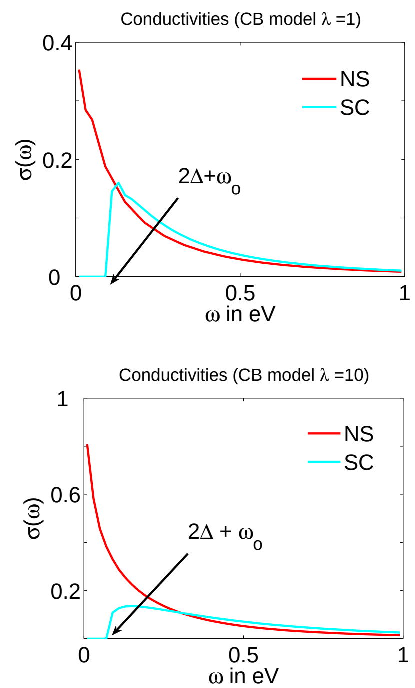

FIG. 17: Conductivities and ΔW for a fixed $\lambda\omega_{sf}$. Top – $\omega_{sf} = 26\,meV$,$\lambda = 1$,$\omega_o = 40\,meV$,$Z_o = 0.77$ Bottom – $\omega_{sf} = 2.6\,meV$,$\lambda = 10$,$\omega_o = 13.5\,meV$,$Z_o = 1.22$. The zero crossing for ΔW is not affected by a change in λ because it is determined only by $\lambda\omega_{sf}$. We set $\Delta = 30\,meV$.

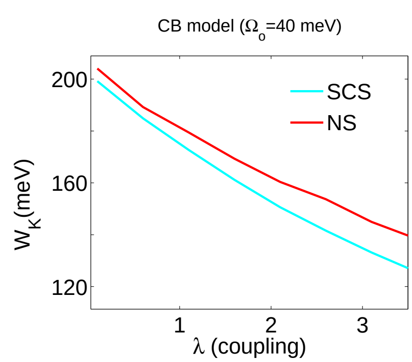

FIG. 18: The behavior of Kubo sums in the CB model. Note that the spectral weight in the NS is always larger than in the SCS. We set $\omega_{sf} = 26\,meV$,$\lambda = 1$, and $\Delta = 30\,meV$.

We performed the same calculations of conductivities and optical integrals as in the previous three cases. The results are summarized in Figs. 17 - 22. Fig 17 shows conductivities in the NS and the SCS for two couplings $\lambda = 1$ and $\lambda = 10$ (keeping $\lambda\omega_{sf}$ constant). Other parameters Z_o and ω_o are calculated according to the discussion after Eq 21. for $\omega_{sf} = 26\,meV$, $\lambda = 1$, we find $\omega_o = 40\,meV$, $Z_o = 0.77$. And for $\omega_{sf} = 2.6\,meV$, $\lambda = 10$, we find $\omega_o = 13.5\,meV$, $Z_o = 1.22$. Note that the conductivity in the SCS starts at $2\Delta + \omega_o$ (i.e. the resonance energy

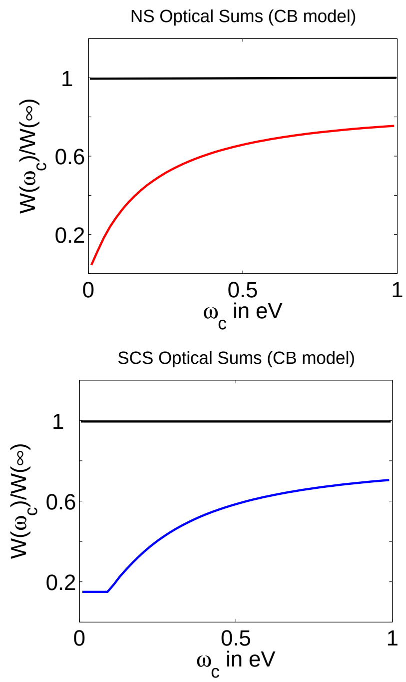

FIG. 19: The evolution of the optical integrals in the NS and the SCS in the CB model. Note that about $\sim 75\%$ of the spectral weight is recovered up to $1\,eV$. We set $\omega_{sf} = 26\,meV$,$\lambda = 1$, and $\Delta = 30\,meV$.

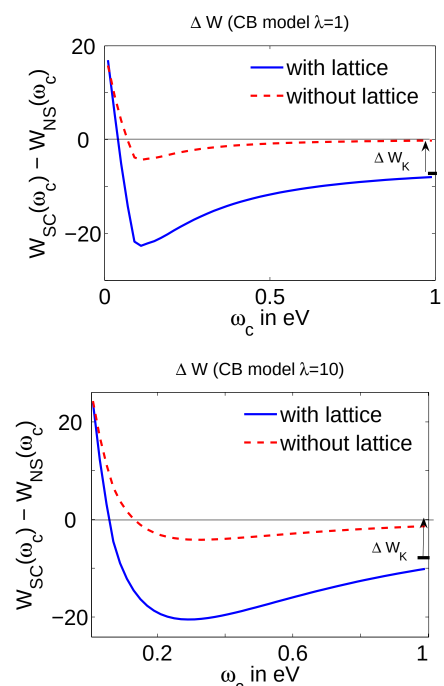

FIG. 20: ΔW (in meV) for $\lambda = 1$(top) and $\lambda = 10$(bottom). We used $\omega_{sf} = 26\,meV/\lambda$ and $\Delta = 30meV$. The zero crossing is not affected because we keep $\lambda\omega_{sf}$ constant. The notable difference is the widening of the dip at a larger λ.