

CCK E&M Problem: Susceptibility
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- A. A uniform external electric field $E_0 \hat{z}$ is applied to a conducting sphere of radius R . What is the resulting electric dipole moment of the sphere?
- B. A second, identical sphere is now introduced at a distance $d \gg R$. Show that the field due to the first sphere is negligible compared to E_0 . Thus, the polarization of the two spheres is practically independent.
- C. A dielectric solid is approximated by a lattice of conducting spheres, radius R , with number density n (m^{-3}). Assuming $nR^3 \ll 1$, what is the electric susceptibility χ_e of the material?