

PHYS 703 - Potential due to a sphere.

A conducting sphere is initially uncharged. At time $t = 0$ it suddenly acquires a surface charge density $\sigma = \sigma_0 \cos \theta$. Find the scalar potential and electric field on the positive z -axis outside the sphere as a function of time. Assume that $\vec{J} = 0$ and thus $\vec{A} = 0$ even though it gives rise to $\vec{B} = 0$ for all times which we know can't be true.