

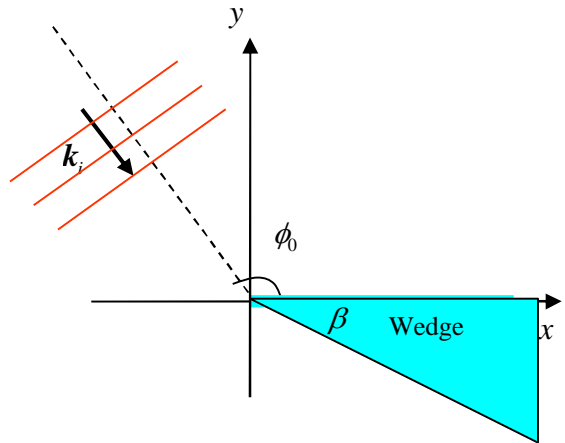
EM Scattering

Homework assignment 3

Problem 1:

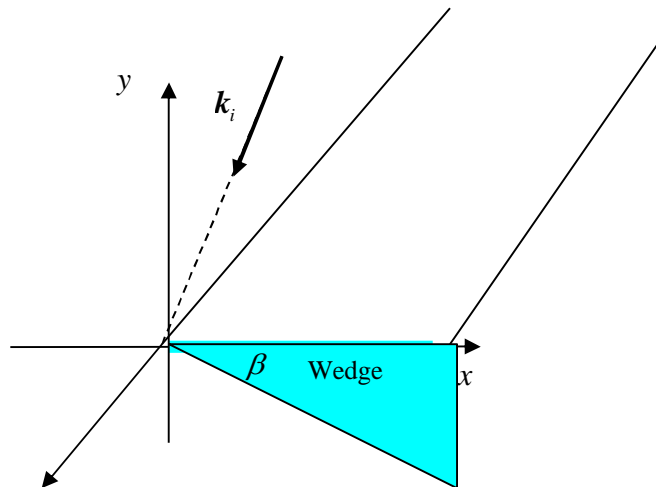
A uniform TE^z plane wave (magnetic field along the z-direction) is normally incident on a perfectly conducting wedge with $\beta = 30\text{deg}$ at an angle ϕ_0 .

The amplitude of the incident wave is E_0 . Calculate the current density on the top and bottom surfaces of the half plane. Plot the current density on these two surfaces for $\phi_0 = 45, 90, 180\text{deg}$. The dielectric constant and permeability of the surrounding medium are ϵ_0, μ_0 .



Problem 2:

By using a line of magnetic current $M = M_0 \exp(-jk_z z), k_z < k_0$, as the source, solve the problem of oblique TE^z scattering from a perfectly conducting wedge where the incident electric field lies in the x-y plane and the incident wave vector is not normal to the wedge but has a component along z, i.e., $k_i = (k_{ix}, k_{iy}, k_{iz})$.



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