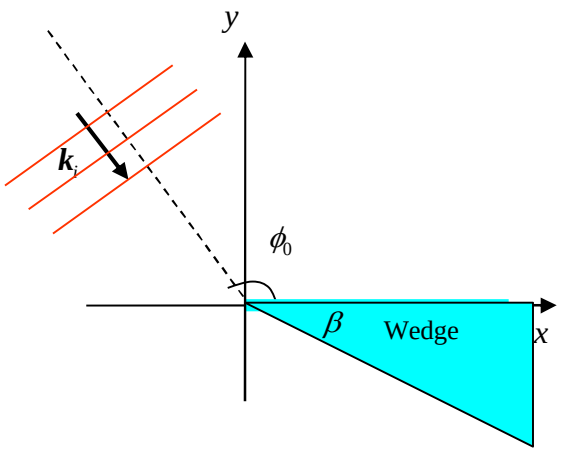
# EM Scattering

## 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 $\phi_0$. 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 $\varepsilon_0, \mu_0$.




**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., $\boldsymbol{k}_i = (k_{ix}, k_{iy}, k_{iz})$.