We have: ε_a = air dielectric constant, ε_p = prism dielectric constant.
ε_m = metal " "

Spp dispersion: $\boxed{K_{x} = K_0\sqrt{\frac{\varepsilon_a\varepsilon_m}{\varepsilon_a+\varepsilon_m}}}$ (1) , $\omega = K_{spp}\, c$

Within the prism: $\omega = \frac{c}{\sqrt{\varepsilon_p}} K_p$, $K_p = \sqrt{\varepsilon_p}\, K_0$

(2) $\Rightarrow \boxed{K_x = \sqrt{\varepsilon_p}\, K_0 \sin\theta_c}$ → x component of incident wavevector.

Coupling occures when: (1) = (2)

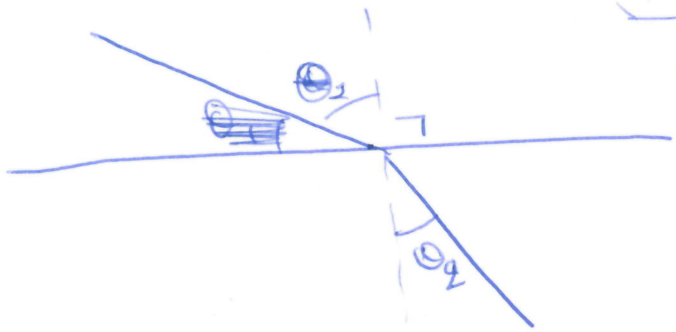
$\Rightarrow K_0\sqrt{\frac{\varepsilon_a\varepsilon_m}{\varepsilon_a+\varepsilon_m}} = \sqrt{\varepsilon_p}\, K_0 \sin\theta_c$, θ_c: coupling angle within the prism.

$\Rightarrow \boxed{\sin\theta_c = \sqrt{\frac{\varepsilon_a\varepsilon_m}{(\varepsilon_a+\varepsilon_m)\varepsilon_p}}}$ (3) , $0^\circ \le \theta_c \le 90^\circ$

Snells law:

$\boxed{n_1 \sin\theta_1 = n_2 \sin\theta_2}$ (4)

$n = \sqrt{\varepsilon}$



Coupling at a certain frequency ω:

- To have coupling, the angle of incidence within the prism needs to be θ_c, given by (3).

- Surface needs to be such that for any angle of incidence θ_0 with respect to the bottom of the prism, light is refracted in a way to get a transmitted ray at angle θ_c.