

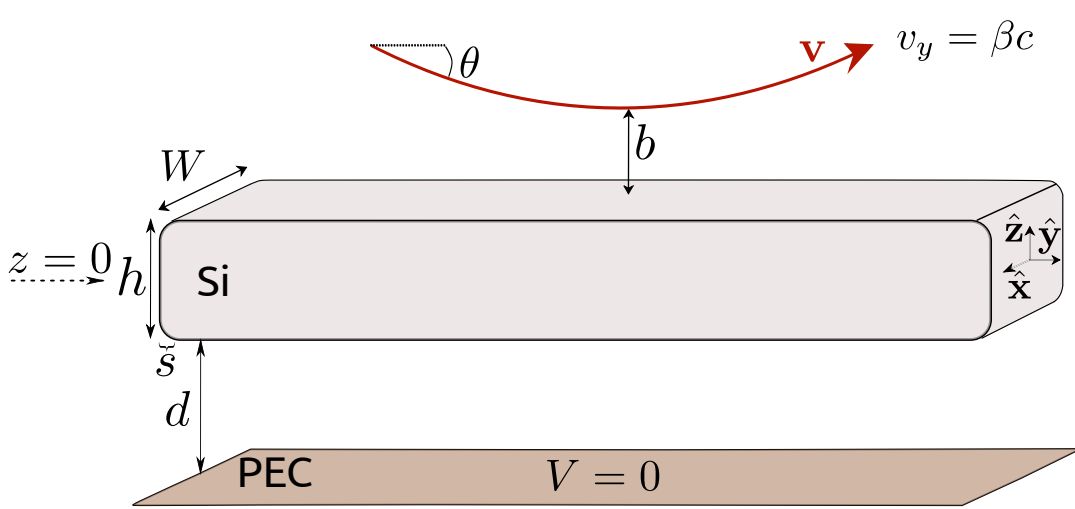
# Electron-coupling-to-waveguide

Correction of the trajectory and integration

$$\Gamma_{\text{EELS}}(\omega) = 2 \int_{z_{\text{min}}}^{\infty} \frac{\beta dz}{\sqrt{\beta^2 \sin^2 \theta + \frac{2eV(z)}{m_e c^2 \gamma_e}}} \boxed{\frac{d\Gamma_{\text{EELS}}(\omega, z)}{dy}} \quad \text{from bem2D}$$

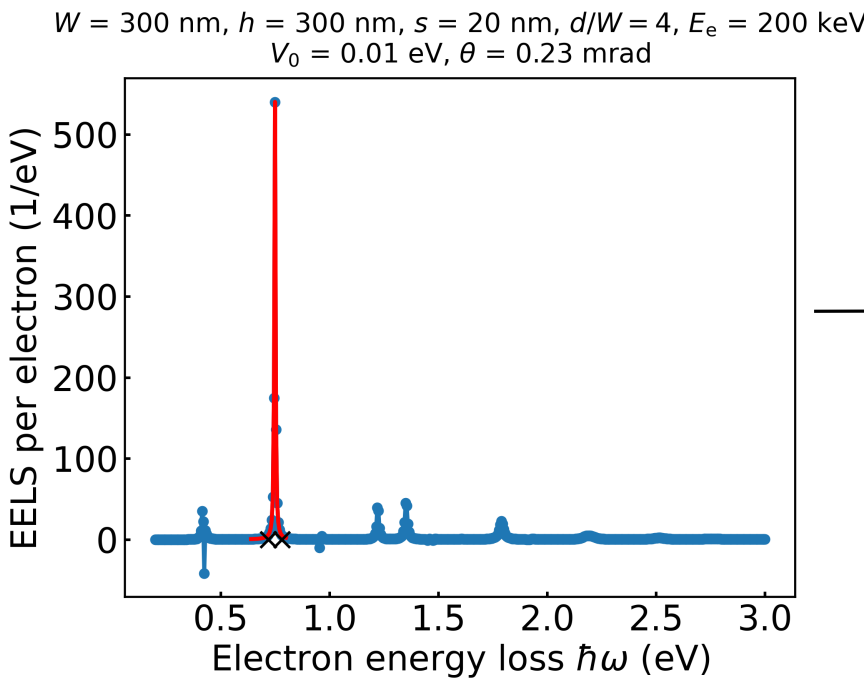
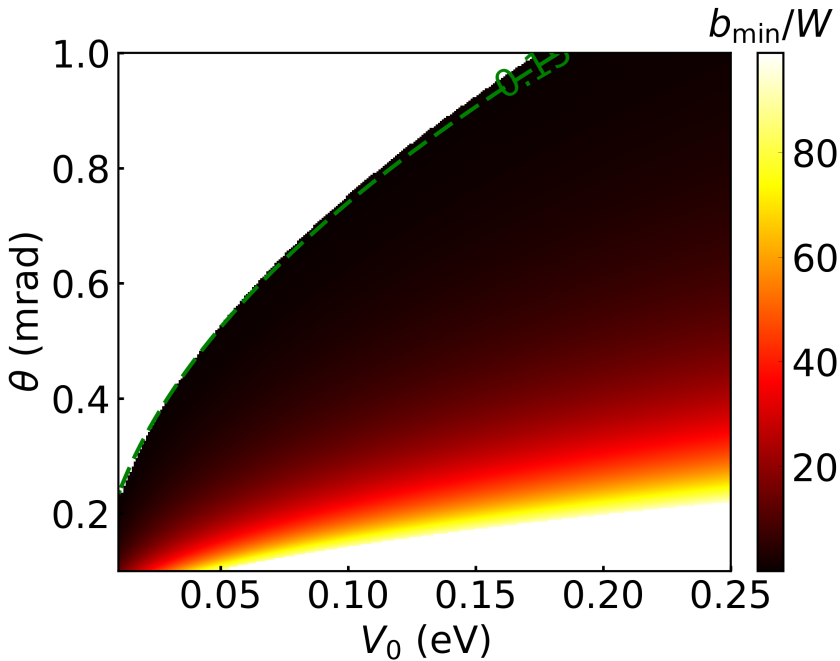
$d = 1200 \text{ nm}$

$b_{\text{min}} = 45 \text{ nm}$

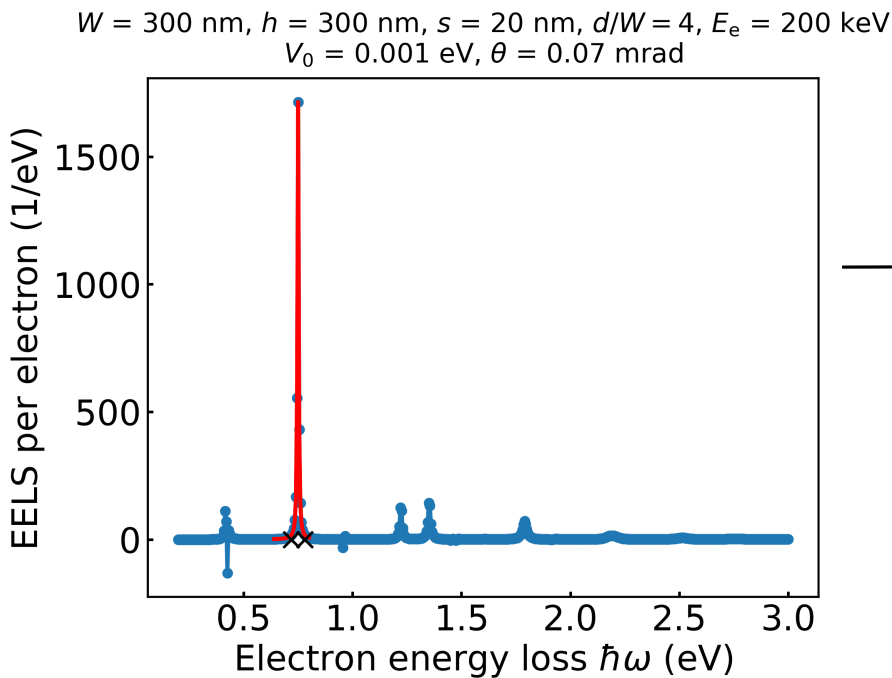
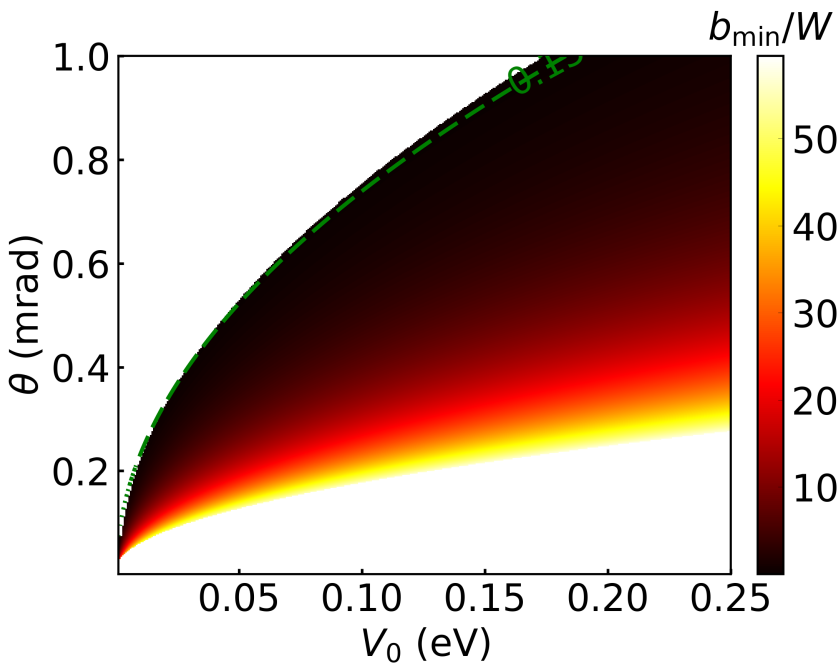


$E_e = 200 \text{ keV}$

$$0 = \frac{V(z_{\text{min}})}{V_0} + \frac{m_e c^2 \gamma_e}{2e} \frac{\beta^2 \sin^2 \theta}{V_0}$$



→ EELS integrated over mode (red) ~ 5



→ EELS integrated over mode (red) ~ 16

same for smaller values of  $V_0$  and  $\theta$  for the same  $b_{\text{min}} = 45 \text{ nm}$