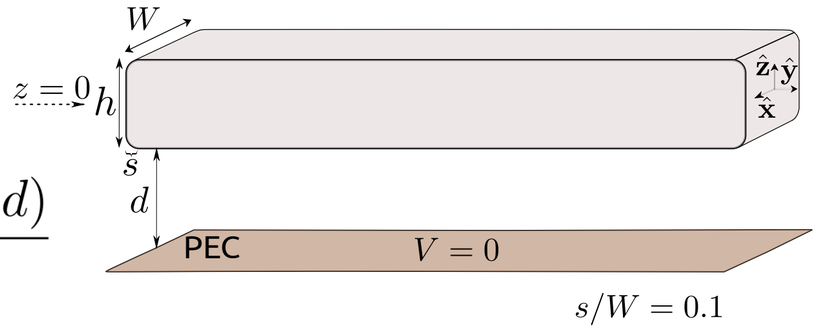
Electron-coupling-to-WG: Potential near rectangular nanowire



Analytical limit for a charge wire when d>>1:

values from BEM cc+ code

$$\frac{V(z)}{V_0} = \frac{\log(z/d) + \Delta(h/W)}{\log(h/2d) + \Delta(h/W)} \dashrightarrow \Delta(h/W) = \frac{\log(z/d) - [V(z)/V_0]\log(h/2d)}{[V(z)/V_0] - 1}$$

$$\Delta(h/W) = A(d/W) + B(d/W)\mathrm{e}^{-C(d/W)zh}$$ (fitting parameters)

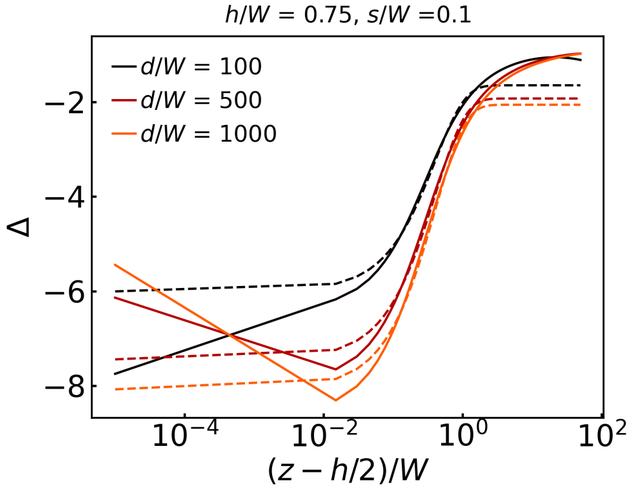
Motivation to analytical V(z) : z_{min} analytical

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

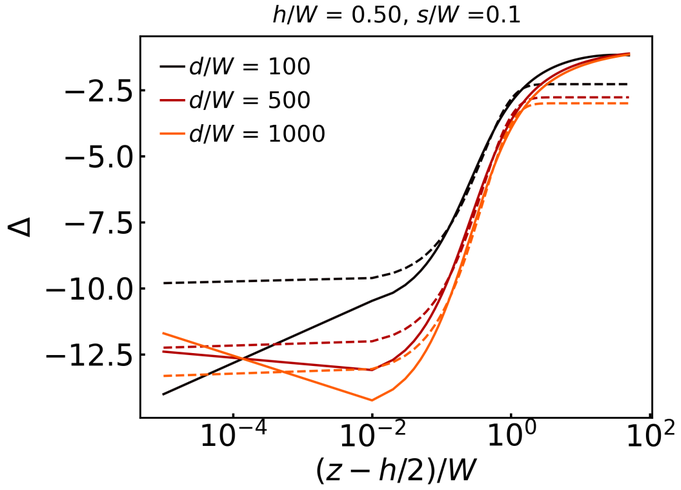
Potential: correction fitting (dashed)

region of interested for the fitting ~ 0.1

$h/W = 0.75$



$h/W = 0.5$



$h/W = 0.25$