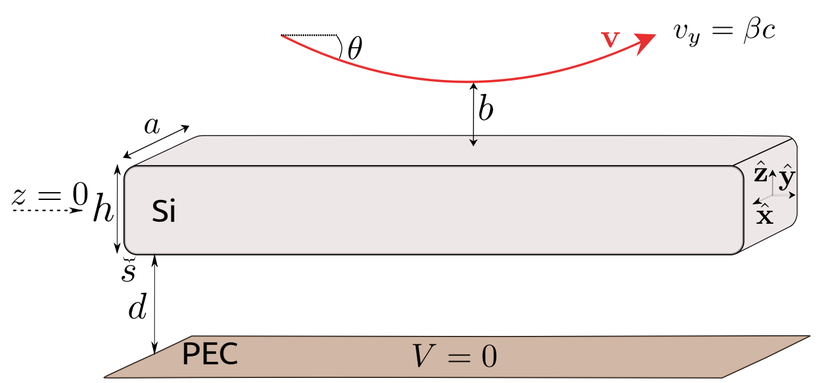
Electron-coupling-to-WG: Potential near rectangular nanowire

From motion equation: $\dfrac{\mathrm{d}z}{\mathrm{d}t} = \sqrt{\dfrac{2eV(z)}{m_\mathrm{e}\gamma_\mathrm{e}} + v_{\perp\infty}^2}$

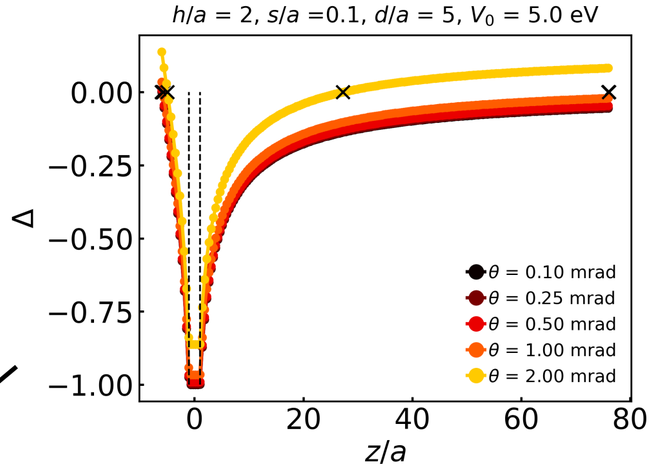
Minimum value of z: $\Delta = \dfrac{V(z)}{V_0} + \dfrac{m_\mathrm{e}c^2\gamma_\mathrm{e}}{2e}\dfrac{\beta^2\sin^2\theta}{V_0}$



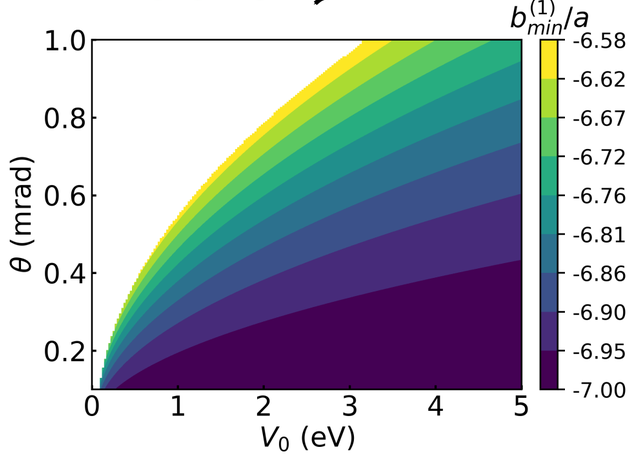
$d/a = 5$ $\quad h/a = 2 \quad s/a = 0.1$

$E_\mathrm{e} = 200$ keV

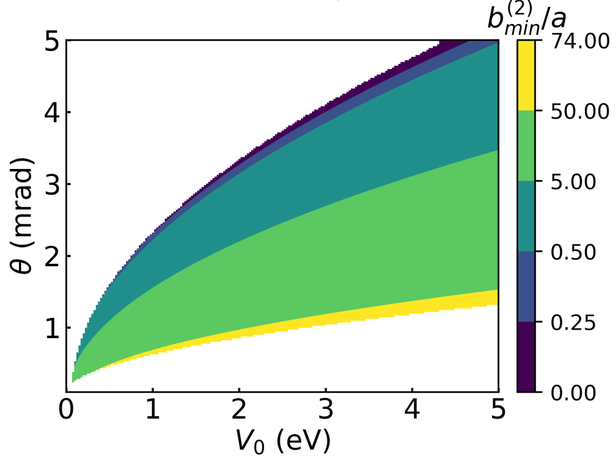
Potential decays faster for smaller d/a
so the z_{min} is smaller



electron between PEC and WG



electron above the WG



Potential from c++ code:

between PEC and WG (1)

above the WG (2)

gate at V=0