

2012

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bound state to dot-wire

$$(1) \quad \langle 0 | H | \psi \rangle = E_0 \psi_0 + \lambda \psi(x_0)$$

$$(2) \quad \langle x | H | \psi \rangle = -\frac{\hbar^2}{2m} \psi''(x) + \lambda \psi_0 \delta(x-x_0)$$

$$(3) \quad \int_{-\infty}^{\infty} U(E) = \frac{\lambda^2}{E-E_0}$$

(4) matching over delta

$$\sqrt{2mE} = m \frac{\lambda^2}{E_0 - E}$$

$$(5) \quad E = - \left[m \lambda^4 / 2 \right]^{1/3}$$