

J01Q.2—Scattering From Two Delta-function Potentials

Problem

Consider a beam of particles moving in one dimension in a potential $V(x)$ consisting of two delta-functions with strength α separated by a distance a ,

$$V(x) = \alpha (\delta(x) + \delta(x - a)).$$

The particles come in from $x = -\infty$ with momentum $p > 0$. Find the transmission and reflection coefficients. For a given strength $\alpha \neq 0$, find the condition on distance a so that the particles are completely transmitted. Show graphically that the condition has at least one solution.