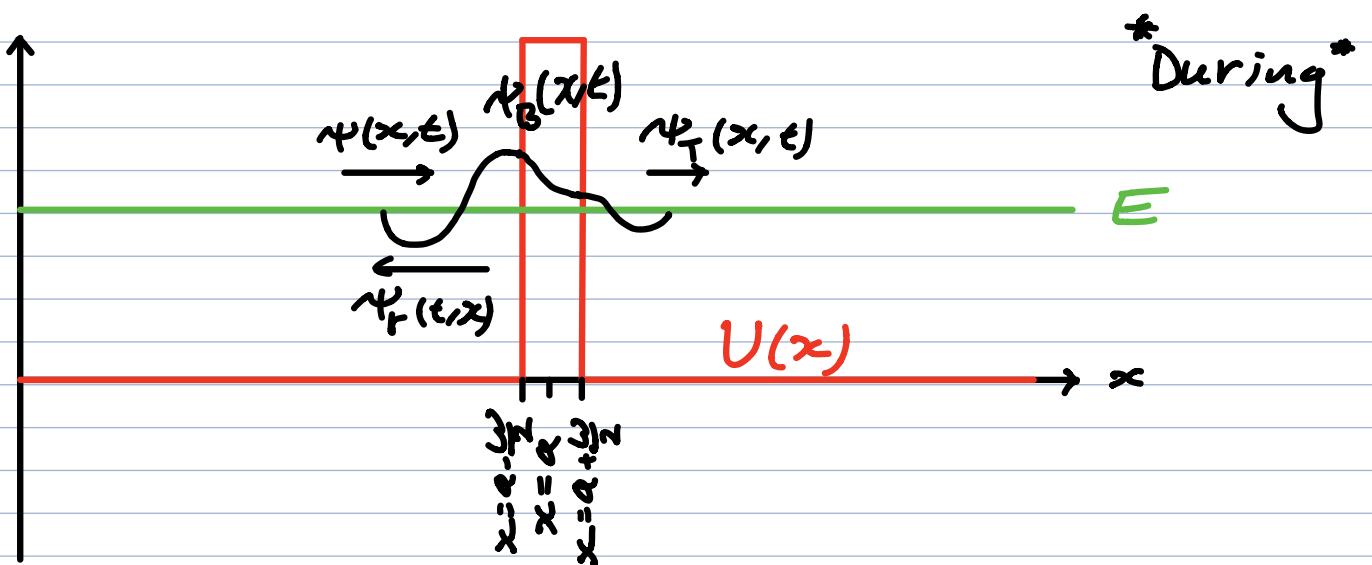
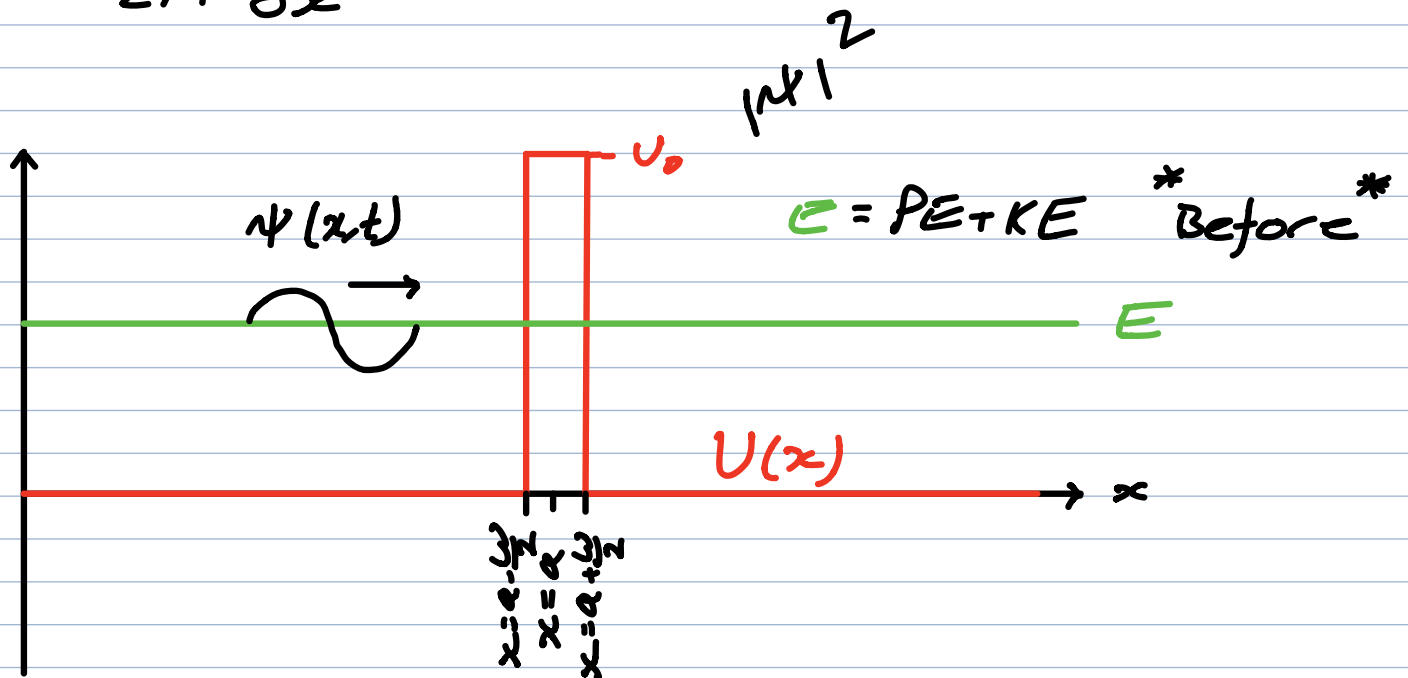
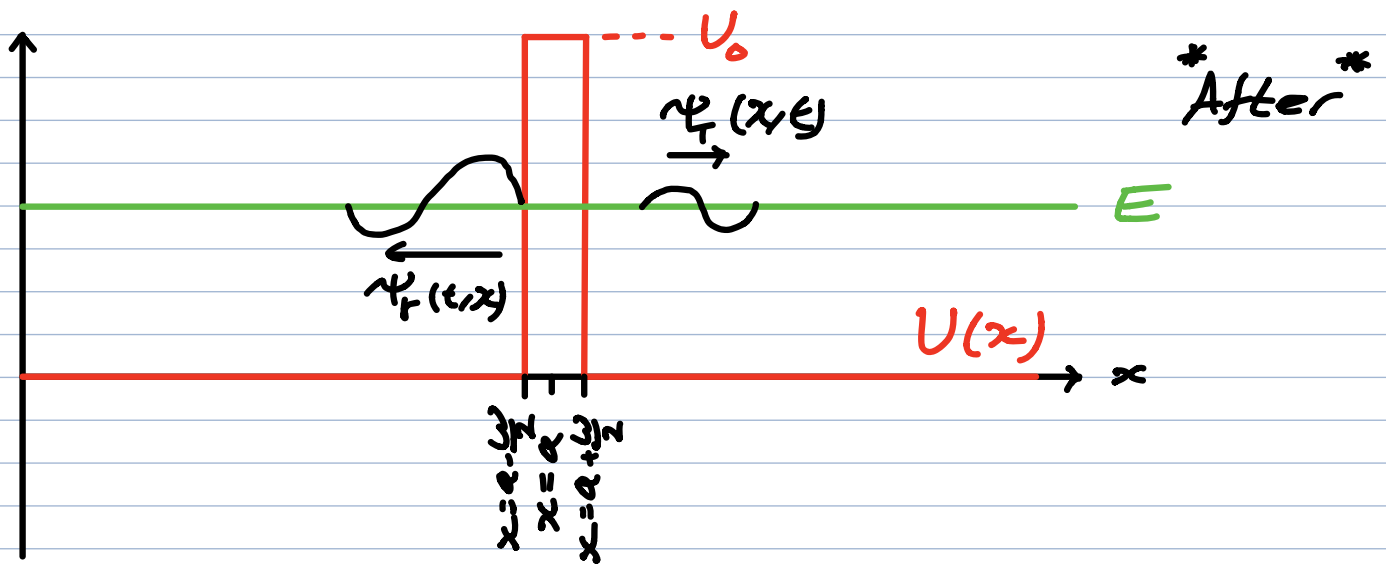


Quantum Tunnelling

- Schrödinger picture (non relativistic):

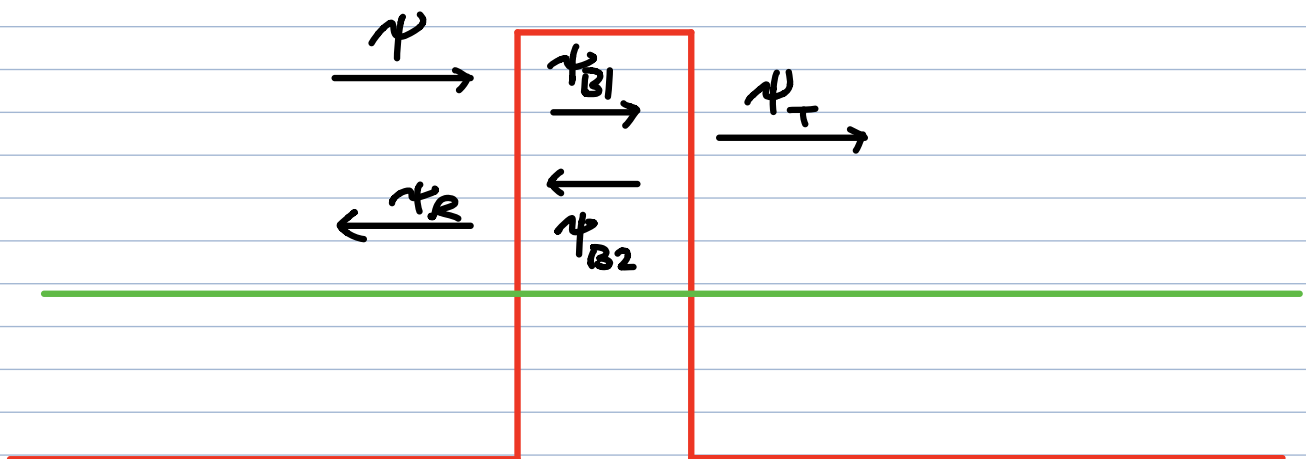
$$-\frac{\hbar^2}{2M} \frac{\partial^2 \psi}{\partial x^2} + U(x) \psi = -i\hbar \frac{\partial \psi}{\partial t}$$

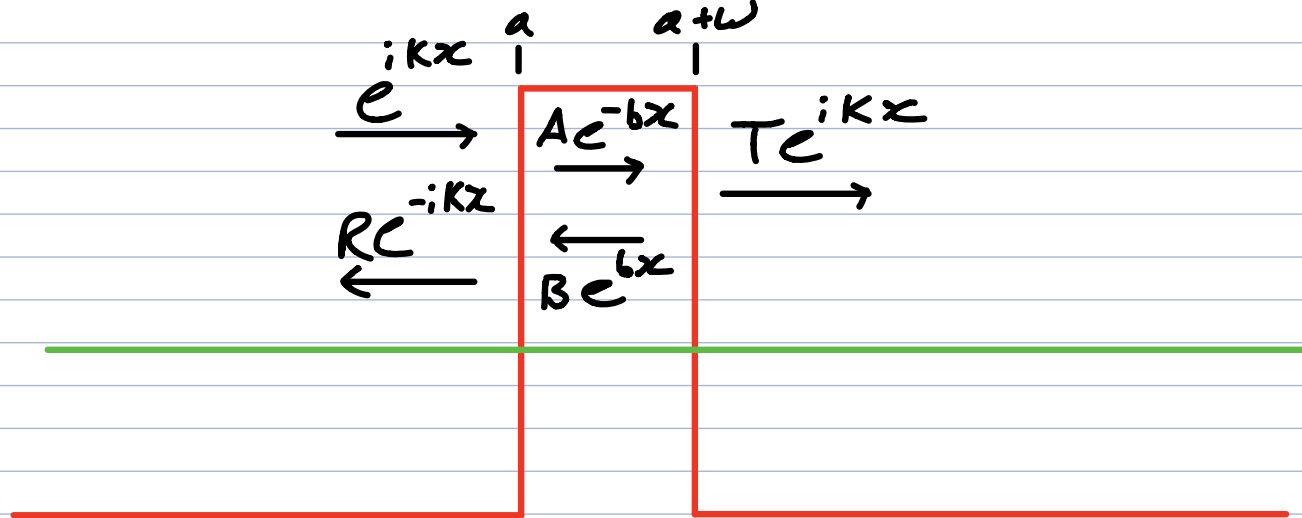




Assuming long wave packets (Momentum eigenstate coming in)

We have a stationary (time independent) solution





Continuity of ψ :
$$e^{ika} + R e^{-ika} = A e^{-ba} + B e^{ba}$$

$$A e^{-b(a+w)} + B e^{b(a+w)} = T e^{ik(a+w)}$$

Continuity of $\frac{d\psi}{dx}$:
$$ik[e^{ika} - R e^{-ika}] = b[-A e^{-ba} + B e^{ba}]$$

$$b[-A e^{-b(a+w)} + B e^{b(a+w)}] = ik T e^{ik(a+w)}$$

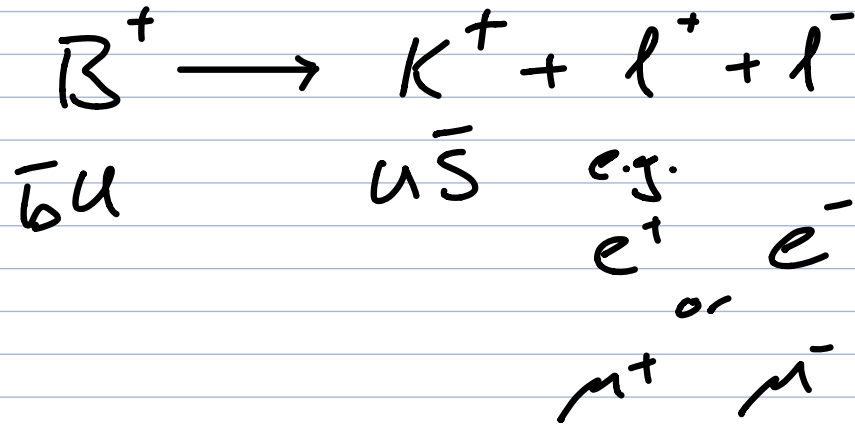
$$k = \frac{\sqrt{2mE}}{\hbar} \quad b = \frac{\sqrt{2m(U_0 - E)}}{\hbar}$$

Interested in finding T :

$$|T|^2 = \left[1 + \frac{\sinh^2\left(\frac{\sqrt{2m(U_0 - E)}}{\hbar}\right)}{4 \frac{E}{U_0} \left(1 - \frac{E}{U_0}\right)} \right]^{-1}$$

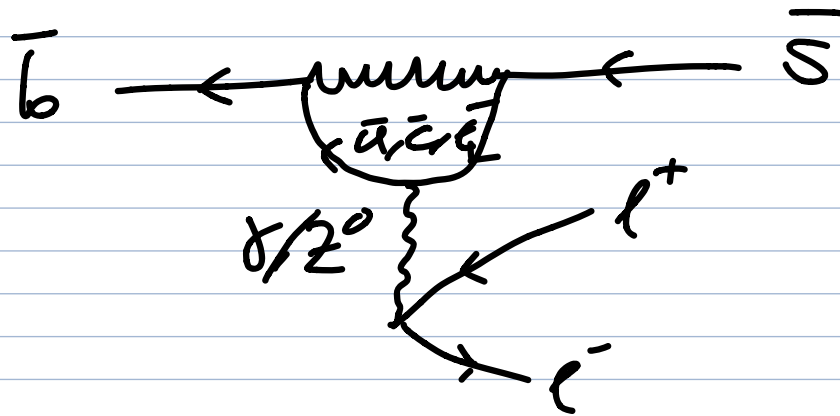
Muon news-1: (~ 3 weeks ago)

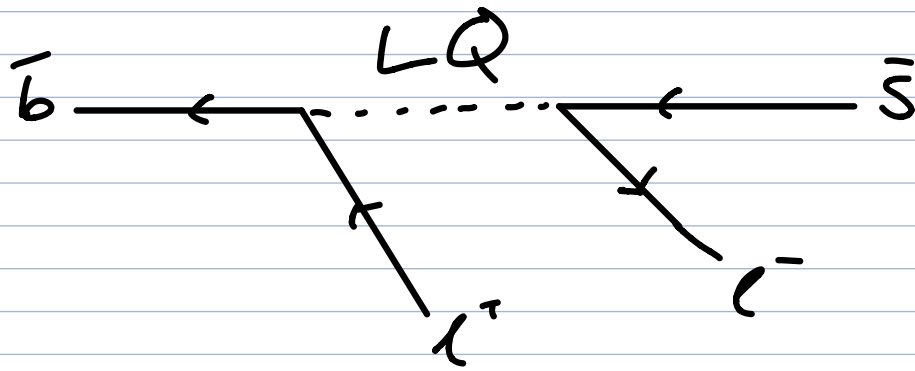
R_K MEASUREMENT:



$$R_K = 0.846 \quad (3.1\sigma)$$

hep-ex: 2103.11769





Muon news - 2 : $g-2$