

## Answer on Question #59521, Physics / Mechanics | Relativity |

A proton is held motionless between two horizontal metal plates 10 cm apart. What voltage should be applied between the plates?

### Solution:

$m = 1.67 \cdot 10^{-27}$  kg, mass of proton

$q = 1.6 \cdot 10^{-19}$  C, charge of proton

$d = 0.1$  m

The gravitational force on a proton would be balanced by the electric field.

Balance of forces:

$$mg = \frac{qU}{d}$$

Therefore,

$$U = \frac{mgd}{q} = \frac{1.67 \cdot 10^{-27} \cdot 9.8 \cdot 0.1}{1.6 \cdot 10^{-19}} \approx 1 \cdot 10^{-8} \text{ V}$$

**Output:**  $1 \cdot 10^{-8} \text{ V}$