## M02E.3-Current in a Cylindrical Wire

## Problem

A current $I$, carried by freely moving electrons, runs through a cylindrical wire with radius $r_{0}$. Assuming that the electrons are moving with velocity $v$ and that the total charge per unit length in the wire vanishes (in the lab frame), find the radial profile of the current. What is the voltage difference between the center and the edge of the cylinder?

