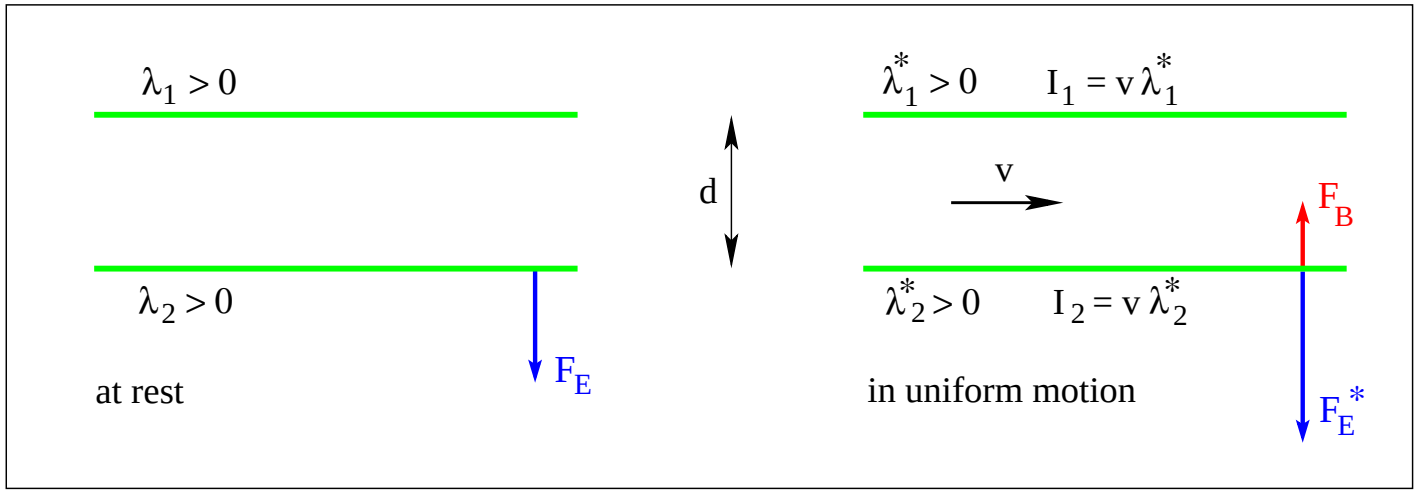
Is There Absolute Motion?

Forces between two long, parallel, charged rods



- $\frac{F_E}{L} = \frac{1}{2\pi\epsilon_0}\frac{\lambda_1\lambda_2}{d}$ (left), $\frac{F_E^*}{L} = \frac{1}{2\pi\epsilon_0}\frac{\lambda_1^*\lambda_2^*}{d}$, $\frac{F_B}{L} = \frac{\mu_0}{2\pi}\frac{I_1 I_2}{d}$, (right)
- $\frac{F_E^* - F_B}{L} = \frac{1}{2\pi\epsilon_0}\frac{\lambda_1^*\lambda_2^*}{d}\left(1 - \frac{v^2}{c^2}\right) = \frac{1}{2\pi\epsilon_0}\frac{\lambda_1\lambda_2}{d}$
- $c = \frac{1}{\sqrt{\epsilon_0\mu_0}} = 2.998 \times 10^8 \mathrm{ms}^{-1}$ (speed of light)
- $\lambda_1^* = \frac{\lambda_1}{\sqrt{1 - v^2/c^2}}, \quad \lambda_2^* = \frac{\lambda_2}{\sqrt{1 - v^2/c^2}}$ (due to length contraction)