

10. We apply $\vec{F} = q(\vec{E} + \vec{v} \times \vec{B}) = m_e \vec{a}$ to solve for \vec{E} :

$$\begin{aligned}\vec{E} &= \frac{m_e \vec{a}}{q} + \vec{B} \times \vec{v} \\ &= \frac{(9.11 \times 10^{-31} \text{ kg})(2.00 \times 10^{12} \text{ m/s}^2) \hat{i}}{-1.60 \times 10^{-19} \text{ C}} + (400 \mu\text{T}) \hat{i} \times [(12.0 \text{ km/s}) \hat{j} + (15.0 \text{ km/s}) \hat{k}] \\ &= (-11.4 \hat{i} - 6.00 \hat{j} + 4.80 \hat{k}) \text{ V/m} \quad .\end{aligned}$$