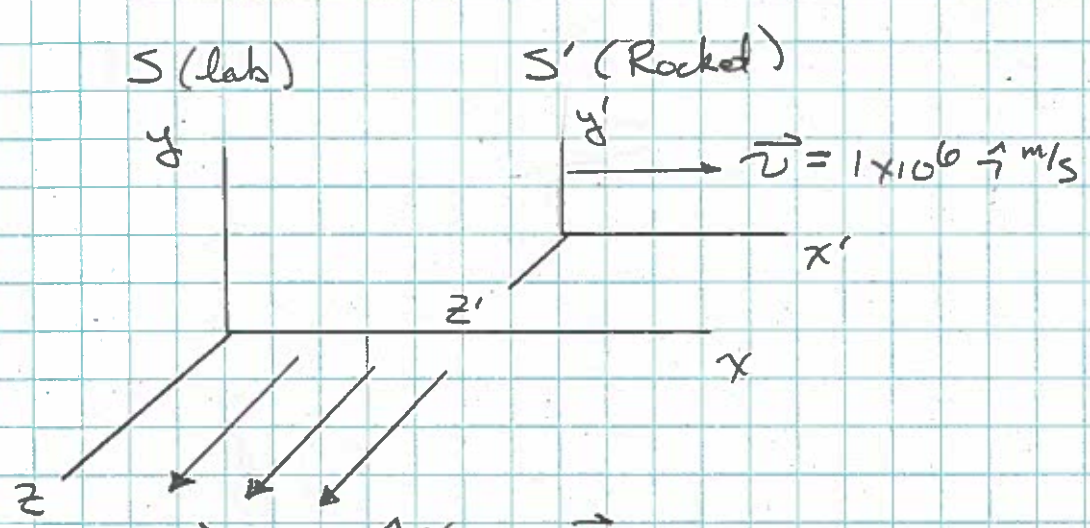

$\vec{E} = 1\times10^6 \hat{k}\ \frac{V}{m}$; $\vec{B} = 0$

On frame S':

$\vec{E}' = \vec{E} + \vec{v}\times\vec{B} = \vec{E} = \underline{1\times10^6 \hat{k}\ \frac{V}{m}}$

$\vec{B}' = \vec{B} - \frac{1}{c^2}\vec{v}\times\vec{E}$

$|\vec{v}\times\vec{E}| = vE\sin 90° = vE$

Direction by RHR in $-y$:

So $\vec{v}\times\vec{E} = -vE\hat{j}$

and,

$\vec{B}' = -\frac{1}{c^2}\vec{v}\times\vec{E} = \frac{vE}{c^2}\hat{j}$

$= \underline{1.11\times10^{-5}\ T}$