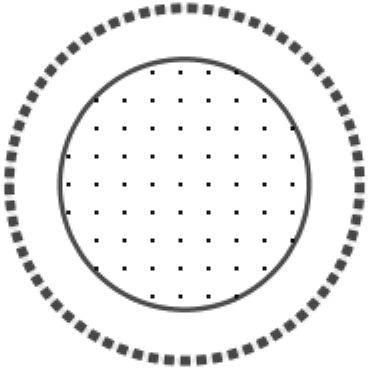


$$B_{\hat{z}(r<R)} = at\hat{z}$$

$$\Phi_B = at\pi R^2$$

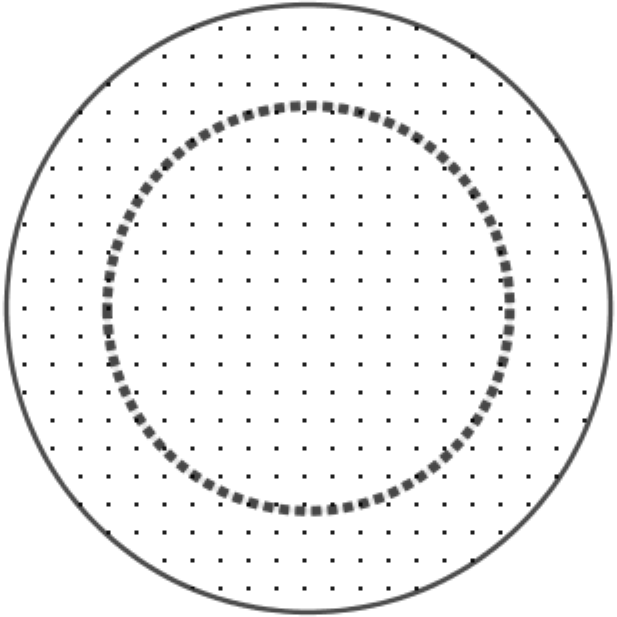
$$\epsilon = \dot{\Phi}_B = a\pi R^2$$

$$\epsilon = \int_0^{2\pi r} \vec{E} \cdot d\vec{l} \quad = 2\pi r \cdot \vec{E}$$

$$\boldsymbol{\frac{a\pi R^2}{2\pi}\frac{1}{r} = \vec{E}_{\hat{\theta}}}$$

$$\vec{\nabla} \times \vec{E} = -\frac{\partial B}{\partial t}$$

$$\begin{aligned}\vec{\nabla} \times \vec{E} = (&\frac{1}{r}\frac{\partial E_{\hat{z}}}{\partial \theta} - \frac{\partial E_{\hat{\theta}}}{\partial z})\hat{r} \\ (&\frac{\partial E_{\hat{r}}}{\partial z} - \frac{\partial E_{\hat{z}}}{\partial r})\hat{\theta} \\ &\frac{1}{r}[\frac{\partial (rE_{\hat{\theta}})}{\partial r} - \frac{\partial E_{\hat{r}}}{\partial \theta}]\hat{z}\end{aligned}$$



$$B_{\hat{z}(r<\infty)} = at\hat{z}$$

$$\Phi_B = at\pi r^2$$

$$\epsilon = \dot{\Phi}_B = a\pi r^2$$

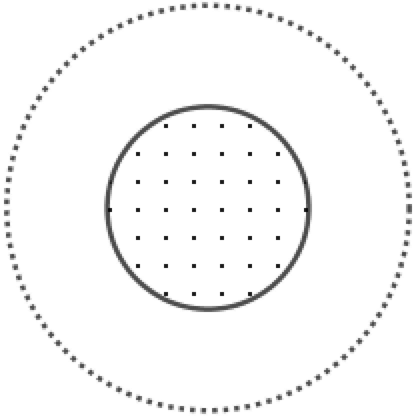
$$\epsilon = \int_0^{2\pi r} \vec{E} \cdot d\vec{l} \quad = 2\pi r \cdot \vec{E}$$

$$\vec{\nabla} \times \vec{E} = -\frac{dB}{dt}$$

$$\vec{\nabla} \times \vec{E} = \left(\frac{1}{r}\frac{\partial E_{\hat{z}}}{\partial \theta} - \frac{\partial E_{\hat{\theta}}}{\partial z}\right)\hat{r}$$
$$\left(\frac{\partial E_{\hat{r}}}{\partial z} - \frac{\partial E_{\hat{z}}}{\partial r}\right)\hat{\theta}$$
$$\frac{1}{r}\left[\frac{\partial(rE_{\hat{\theta}})}{\partial r} - \frac{\partial E_{\hat{r}}}{\partial \theta}\right]\hat{z}$$

$$\boldsymbol{\frac{a\pi}{2\pi} r = \vec{E}_{\hat{\theta}}}$$

$$I_{(r<R)(t)} = at\,\hat{z} \Rightarrow B_{(t)} = \frac{at}{r}\,\hat{\theta}$$



$$\vec{\nabla} \times \vec{E} = -\frac{\partial B}{\partial t}$$

$$\vec{\nabla} \times \vec{E} = (\frac{1}{r}\frac{\partial E_{\hat{z}}}{\partial \theta} - \frac{\partial E_{\hat{\theta}}}{\partial z})\hat{r}$$
$$(\frac{\partial E_{\hat{r}}}{\partial z} - \frac{\partial E_{\hat{z}}}{\partial r})\hat{\theta}$$
$$\frac{1}{r}[\frac{\partial (rE_{\hat{\theta}})}{\partial r} - \frac{\partial E_{\hat{r}}}{\partial \theta}]\hat{z}$$

$$-\frac{\partial B}{\partial t} = -\frac{a}{r}\hat{\theta} = \vec{\nabla} \times \vec{E} = -\frac{\partial E_{\hat{z}}}{\partial r}\hat{\theta}$$

$$\frac{a}{r} = \frac{\partial E_{\hat{z}}}{\partial r}$$

$$\vec{E}_{\hat{z}} = a\int \frac{1}{r}$$

$$\boldsymbol{\vec{E}_{\hat{z}} = a \cdot lan(r)}$$