$$r = \{x - R\cos[\phi],\ y - R\sin[\phi],\ z - \frac{PITCH}{2\pi}\phi\}$$

$$dS = \{-R\sin[\phi]d\phi,\ R\cos[\phi]d\phi,\ \frac{PITCH}{2\pi}d\phi\}$$

$$r = \{x^2 + y^2 + z^2\}^{1/2}$$
$$= \{(x - R\cos[\phi])^2 + (y - R\sin[\phi])^2 + (z - \frac{PITCH}{2\pi}\phi)^2\}^{1/2}$$

$$B_x = \frac{\mu i}{4\pi}\int \frac{r_z\, ds_y - r_y\, ds_z}{r^3} \text{ from } [-\infty, +\infty]$$

$$B_x(x,y,z) = \ldots$$