

### 1 Current from a Spinning Cylinder

A solid cylinder with radius  $R$  and height  $H$  has its base on the  $x, y$ -plane and is symmetric around the  $z$ -axis. There is a fixed volume charge density on the cylinder  $\rho = \alpha z$ . If the cylinder is spinning with period  $T$ :

- (a) Find the volume current density.
- (b) Find the total current.