18. We imagine a cylindrical Gaussian surface A of radius r and unit length concentric with the metal tube. Then by symmetry

$$\oint_A \vec{E} \cdot d\vec{A} = 2\pi r E = \frac{q_{\text{enclosed}}}{\varepsilon_0} \ .$$

(a) For $r > R$, $q_{\text{enclosed}} = \lambda$, so $E(r) = \lambda/2\pi r\varepsilon_0$.

(b) For $r < R$, $q_{\text{enclosed}} = 0$, so $E = 0$. The plot of E vs r is shown below. Here, the maximum value is

$$E_{\max} = \frac{\lambda}{2\pi r\varepsilon_0} = \frac{(2.0 \times 10^{-8}\,\text{C/m})}{2\pi(0.030\,\text{m})\,(8.85 \times 10^{-12}\,\text{C}^2/\text{N}\cdot\text{m}^2)} = 1.2 \times 10^4\ \text{N/C} \ .$$