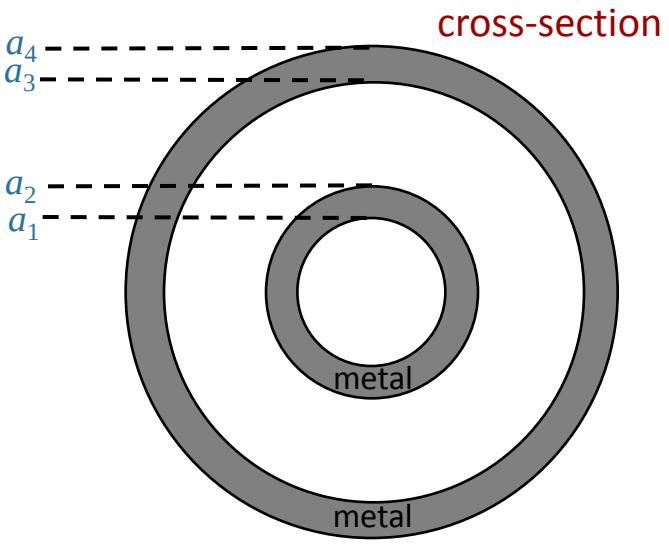
Calculation



A capacitor is constructed from two conducting cylindrical shells of radii a_1, a_2, a_3, and a_4 and length L $(L >> a_i)$.

What is the capacitance C of this capacitor ?

$$C \equiv \frac{Q}{V}$$

➢ Strategic Analysis:

- Put $+Q$ on outer shell and $-Q$ on inner shell
- Cylindrical symmetry: Use Gauss' Law to calculate E everywhere
- Integrate E to get V
- Take ratio Q/V: should get expression only using geometric parameters (a_i, L)