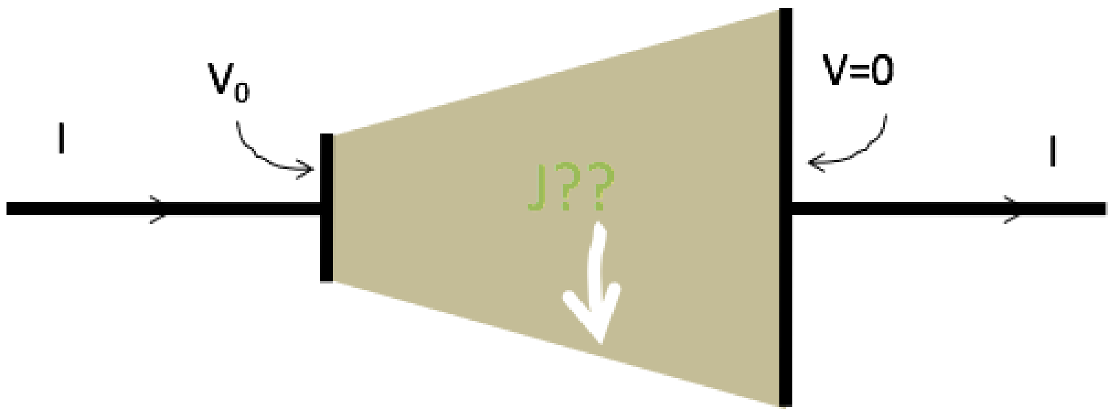
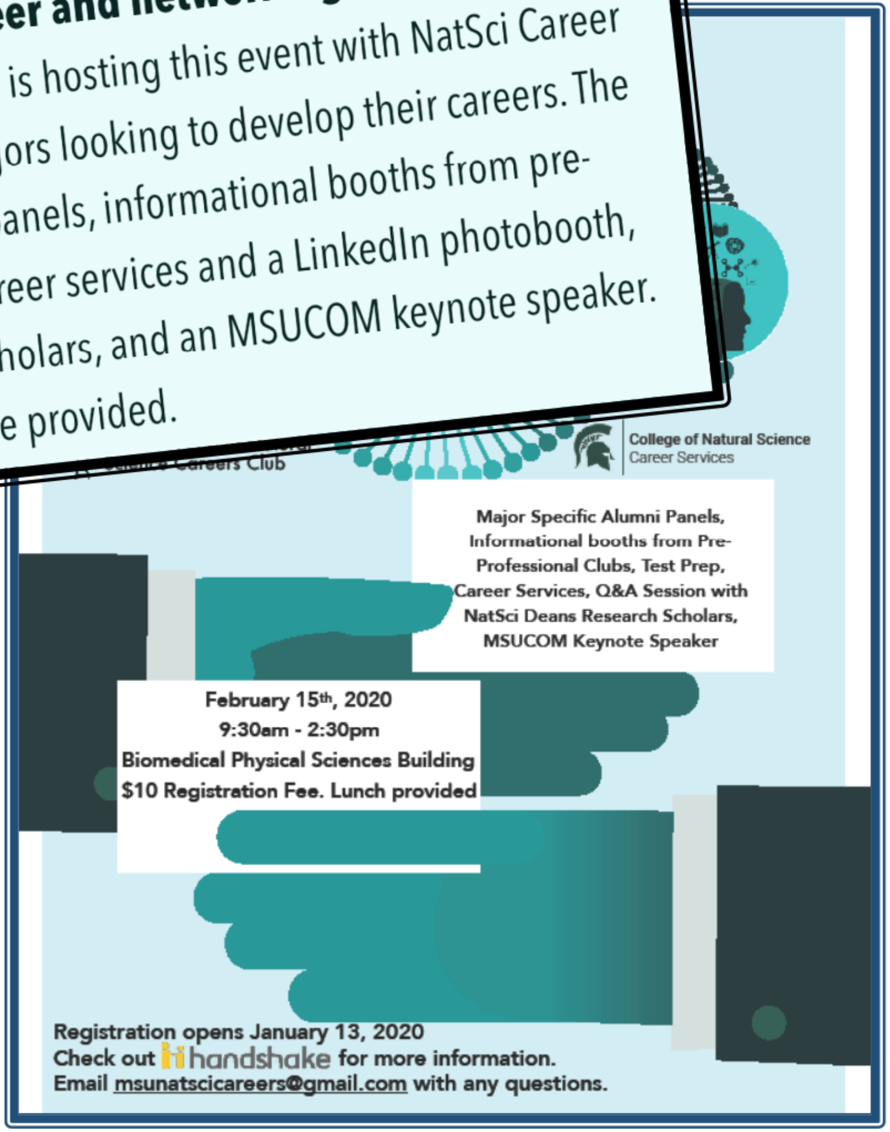
Inside this resistor setup, what can you conclude about the current density $\mathbf{J}$ near the side walls (in steady state)?



A. Must be exactly parallel to the wall
B. Must be exactly perpendicular to the wall
C. Could have a mix of parallel and perp components
D. No obvious way to decide!?

A one-stop-shop for all your career and networking needs!

MSU College of Natural Science Careers Club is hosting this event with NatSci Career Services for all math, science, and health majors looking to develop their careers. The event will feature major-specific alumni panels, informational booths from pre-professional clubs, test prep companies, career services and a LinkedIn photobooth, Q&A session with NatSci Deans Research Scholars, and an MSUCOM keynote speaker. Lunch will be provided.

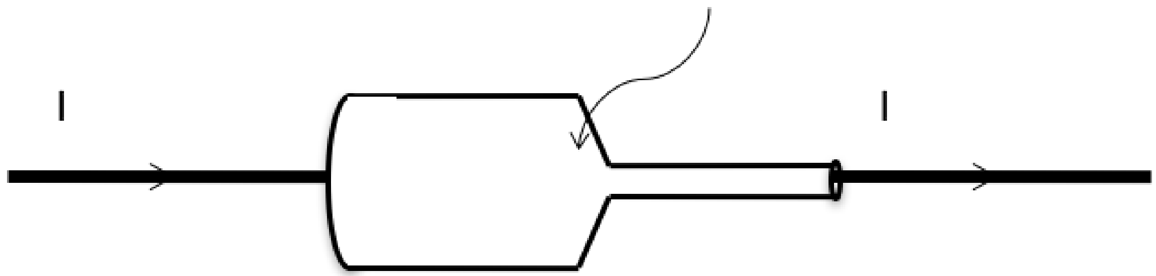


Activity: Consider two spheres (radii a and b with $b>a$) that are constructed so that the larger one surrounds the smaller one. Between them is a material with conductivity σ. A potential difference of V is maintained between them with the inner sphere at higher potential.

- What is the current I flowing between the spheres in terms of the known variables?
- How does your result relate to Ohm's Law?

Hint: Assume a uniform charge $+Q$ distributed over the inner sphere and use Gauss' Law to find $\mathbf{E}$.

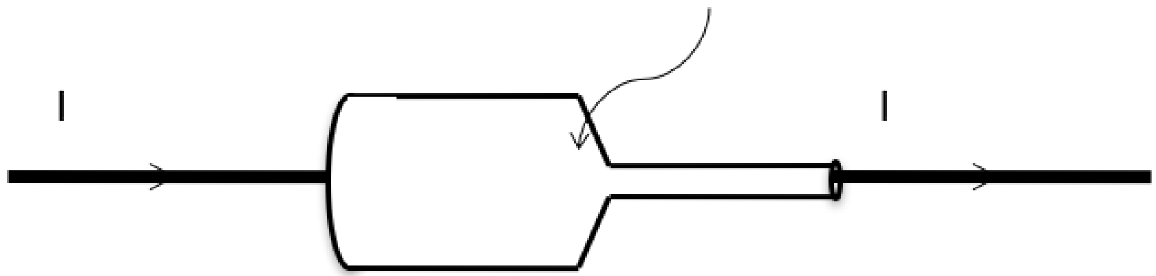
Recall the machined copper from last class, with steady current flowing left to right through it



In the "necking down region" (somewhere in a small-ish region around the head of the arrow), do you think

A. $\nabla \cdot \mathbf{E} = 0$
B. $\nabla \cdot \mathbf{E} \neq 0$

Recall the machined copper from last class, with steady current flowing left to right through it



In steady state, do you expect there will be any surface charge accumulated anywhere on the walls of the conductor?

A. Yes

B. No