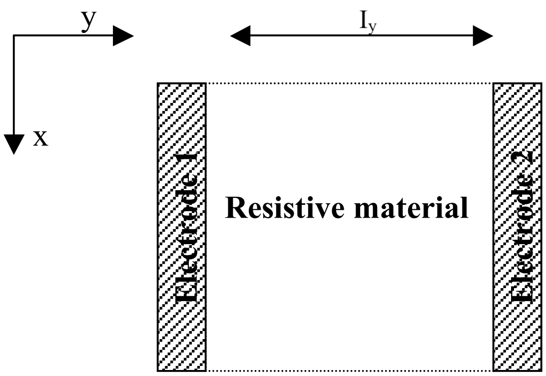


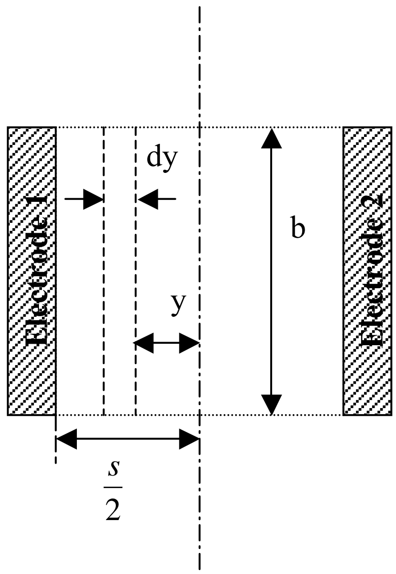
- Resistivity of the "resistive material" is much higher than the resistivity of the electrodes, $\rho_{rm} >> \rho_e$

- Power generated (loss):

$$dP = I^2\, dR$$

I_y, lateral current flow; current density is Jby

$$dR = R_{sheet}\frac{dy}{b}$$



- It may be simply shown that $J_x = 0$ for $x = \frac{s}{2}$, which means each electrode collects the current from exactly one half of the area

- Symmetry considerations predict $J_y = 0$ everywhere

Then, the total power loss (dissipation):

$$P_{loss} = \int_0^{\frac{s}{2}} I^2 dR = \int_0^{\frac{s}{2}} (Jby)^2 R_{sheet}\frac{dy}{b} = \frac{J^2 b R_{sheet}.s^3}{24} = P_{loss}$$

Calculating the "effective resistance" :

$$R_{eff} = \frac{P_{loss}}{J^2(area)^2} = \frac{\frac{J^2 b R_{sheet}.s^3}{24}}{J^2(sb)^2} = \frac{Rsheet}{24}\frac{s}{b} = R_{eff}$$