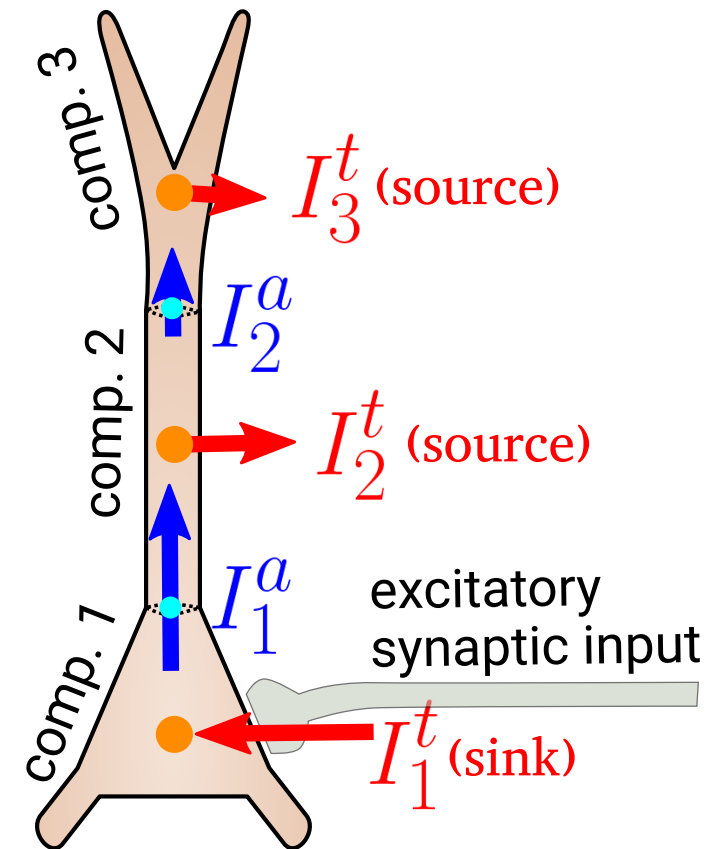


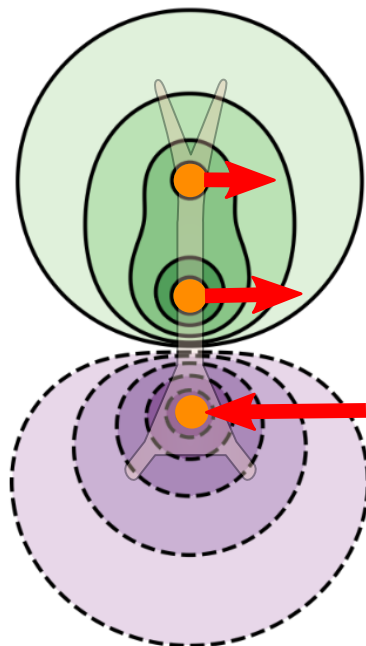
**A**

transmembrane  
currents  
axial currents

**B**

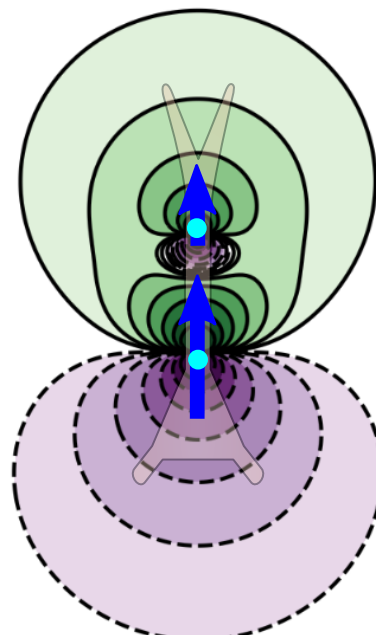
compartment-based

$$\frac{1}{4\pi\sigma} \sum_n \frac{I_n^t}{|\mathbf{r} - \mathbf{r}_n^t|}$$

**C**

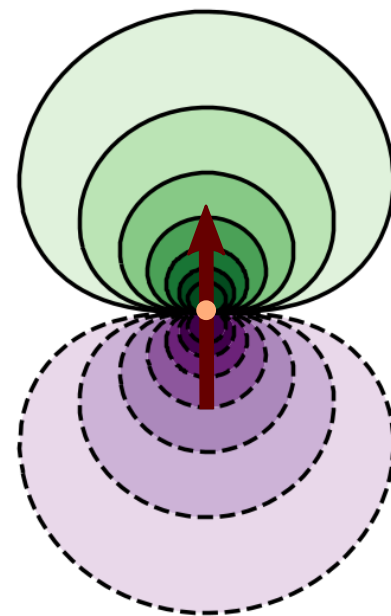
multi-dipole

$$\frac{1}{4\pi\sigma} \sum_n \frac{|I_n^a \mathbf{d}_n| \cos \theta}{|\mathbf{r} - \mathbf{r}_n^a|}$$

**D**

single-dipole

$$\frac{1}{4\pi\sigma} \frac{|\sum_n I_n^a \mathbf{d}_n| \cos \theta}{|\mathbf{r} - \mathbf{r}^s|}$$



current

conservation:

$$\begin{aligned} I_1^t &= -I_1^a & I_3^t &= -I_2^a \\ I_2^t &= I_1^a - I_2^a & I_1^t + I_2^t + I_3^t &= 0 \end{aligned}$$