Units of the Passive Membrane

\[ R_a \] axial resistance \hspace{2cm} \Omega \hspace{2cm} } \) for the entire segment of cable
\[ R_m \] membrane resistance \hspace{2cm} \Omega \hspace{2cm} } \)
\[ C_m \] membrane capacitance \hspace{2cm} F \hspace{2cm} } \)

\[ R_A \] specific axial resistance \hspace{2cm} \Omega \cdot \text{m} \hspace{2cm} } \)
\[ R_M \] specific membrane resistance \hspace{2cm} \Omega \cdot \text{m}^2 \hspace{2cm} } \)
\[ C_M \] specific membrane capacitance \hspace{2cm} \text{F} / \text{m}^2 \hspace{2cm} } \)

\[ R_a = R_A (4l/\pi d^2) \]

\[ \tau_m \] membrane time constant \hspace{2cm} \text{seconds} \hspace{2cm} } \)
\[ \lambda \] membrane space constant \hspace{2cm} \text{meters} \hspace{2cm} } \)

\[ \lambda = \sqrt{ \frac{d R_M}{4 R_A} } \] Describes how the signal decays in time from its source
\[ \tau_m = R_M C_M \] Describes how the signal decays with distance from its source.