

1 “environment” component

This component has no equations.

2 “membrane” component

membrane_voltage_diff_eq

$$\frac{d(V)}{d(time)} = \frac{-((i_{Ca} + i_K + i_{s1} + i_{s2} + i_L))}{Cm}$$

3 “calcium_current” component

i_Ca_calculation

$$i_{Ca} = g_{Ca} * m_{infinity} * (V - V_{Ca})$$

4 “calcium_current_m_gate” component

m_infinity_calculation

$$m_{infinity} = \frac{1.0}{\left(1.0 + e^{\frac{(-22.0 - V)}{7.5}}\right)}$$

5 “rapidly_activating_K_current” component

i_K_calculation

$$i_K = g_K * n * (V - V_K)$$

6 “rapidly activating K current n gate” component

n_diff_eq

$$\frac{d(n)}{d(time)} = \frac{(n_infinity - n)}{\tau_n}$$

n_infinity_calculation

$$n_infinity = \frac{1.0}{\left(1.0 + e^{\frac{(-9.0 - V)}{10.0}}\right)}$$

tau_n_calculation

$$\tau_n = \frac{8.3}{\left(1.0 + e^{\frac{(V + 9.0)}{10.0}}\right)}$$

7 “slow K current” component

i_s1_calculation

$$i_s1 = g_s1 * s1 * (V - V_K)$$

8 “slow K current s1 gate” component

s1_diff_eq

$$\frac{d(s1)}{d(time)} = \frac{(s1_infinity - s1)}{\tau_s1}$$

s1_infinity_calculation

$$s1_infinity = \frac{1.0}{\left(1.0 + e^{\frac{(-40.0 - V)}{0.5}}\right)}$$

9 “very slow K current” component

i_s2_calculation

$$i_s2 = g_s2 * s2 * (V - V_K)$$

10 “very slow K current s2 gate” component

s2_diff_eq

$$\frac{d(s2)}{d(time)} = \frac{(s2_infinity - s2)}{\tau_s2}$$

s2_infinity_calculation

$$s2_infinity = \frac{1.0}{\left(1.0 + e^{\frac{(-42.0 - V)}{0.4}}\right)}$$

11 “leak_current” component

i_L_calculation

$$i_L = g_L * (V - V_L)$$