Quiz 4.2: Separation of Time Scales

Separation of time scales

0 points possible (ungraded)
We start with two equations

$$au_{1}rac{dx}{dt}=-x+y+I\left(t
ight)$$

$$au_2 rac{dy}{dt} = -y + x^2 + A$$

 \blacksquare if $au_{1}\ll au_{2}$ then the system can be reduced to $au_{2}rac{dy}{dt}=-y+\left[y+I\left(t
ight)
ight]^{2}+A$ 🗸

 \blacksquare if $au_{2}\ll au_{1}$ then the system can be reduced to $au_{1}rac{dx}{dt}=-x+x^{2}+A+I\left(t
ight) extcolor{1}$

✓ none of above is correct

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You have used 1 of 1 attempt

Answers are displayed within the problem

Separation of time scales

0 points possible (ungraded)

A channel with gating variable r, given by

$$au_{1}rac{dr}{dt}=-r+r_{0}\left(u
ight)$$

influences the voltage

$$au_2 rac{du}{dt} = -\left(u - u_0
ight) + r^2 A$$

We assume that $au_1 \ll au_2$

IN this case a reduction of dimensionality

is not possible

 $lackbox{ extit{d}}$ is possible and the result is $au_2rac{du}{dt}=-u+u_0+\left[r_0\left(u
ight)
ight]^2A$

lacksquare is possible and the result is $au_1rac{dr}{dt}=-r+r_0\left(u_0+r^2A
ight)$



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You have used 1 of 1 attempt

1 Answers are displayed within the problem