# Step current responce of the HH Model

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A constant current applied to the HH model produces a train of action potentials.

# Three possible responces to a step current

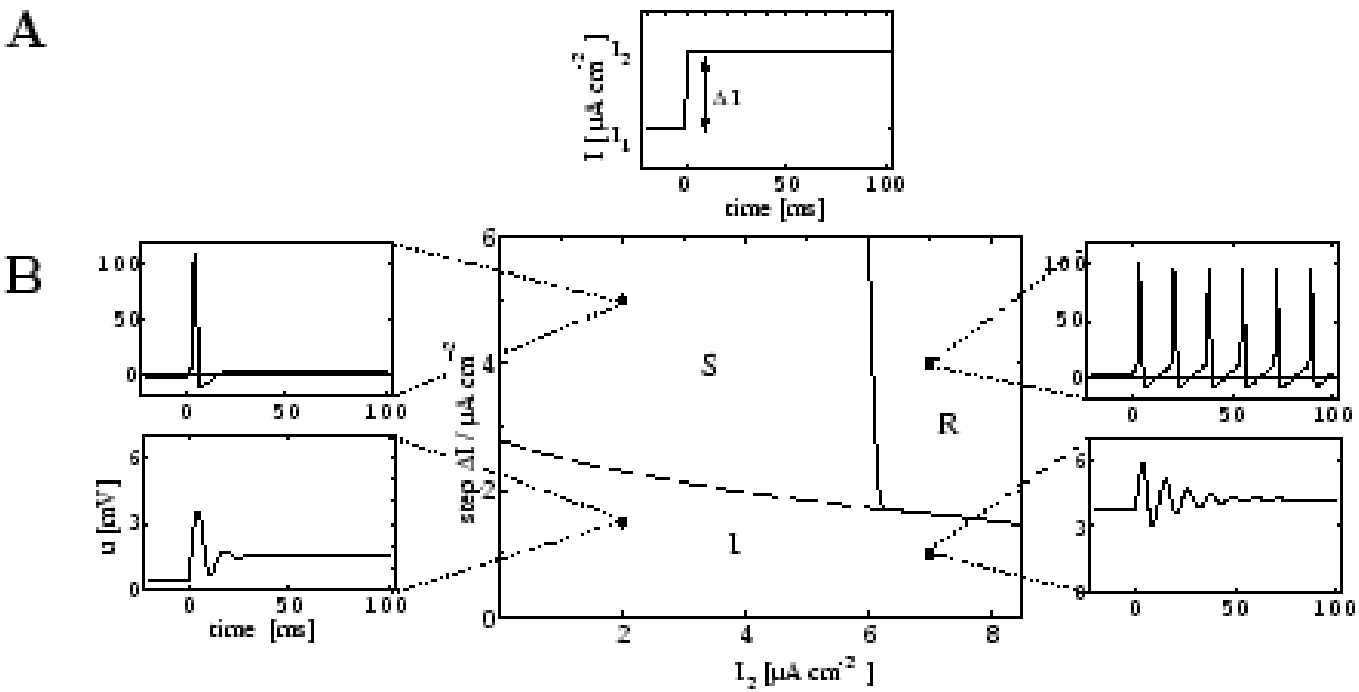



Figure: Phase diagram for stimulation with a step current.



A constant current applied to the HH model produces a train of action potentials.

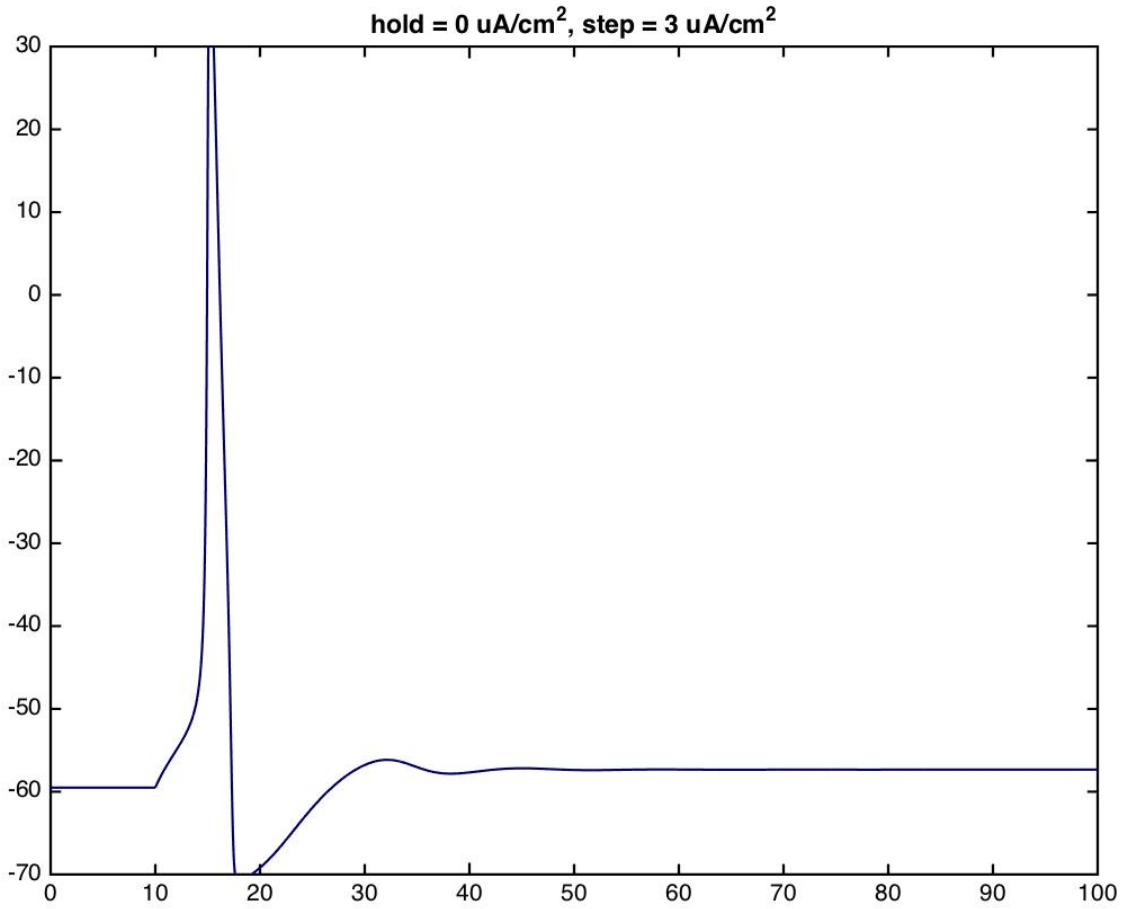



Figure: Simulated single action potential.

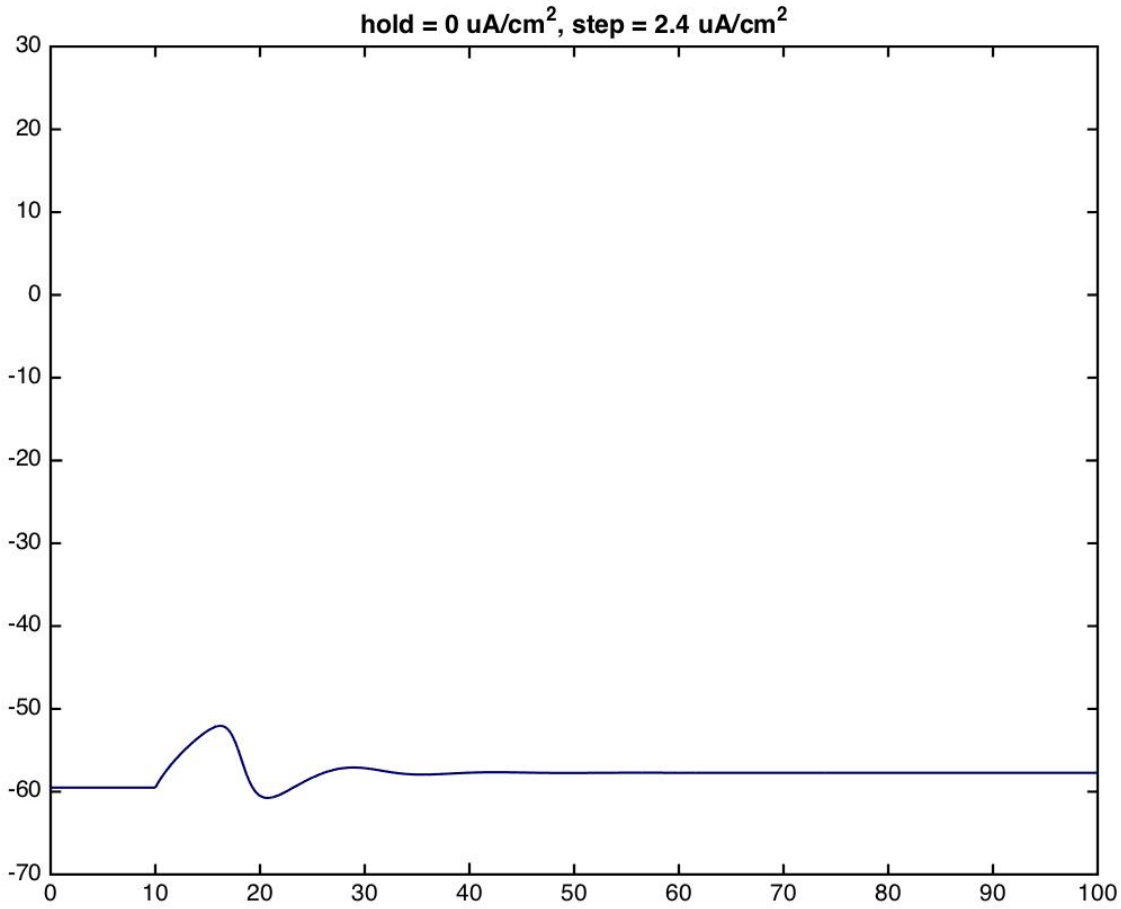



Figure: Simulated ringing response.

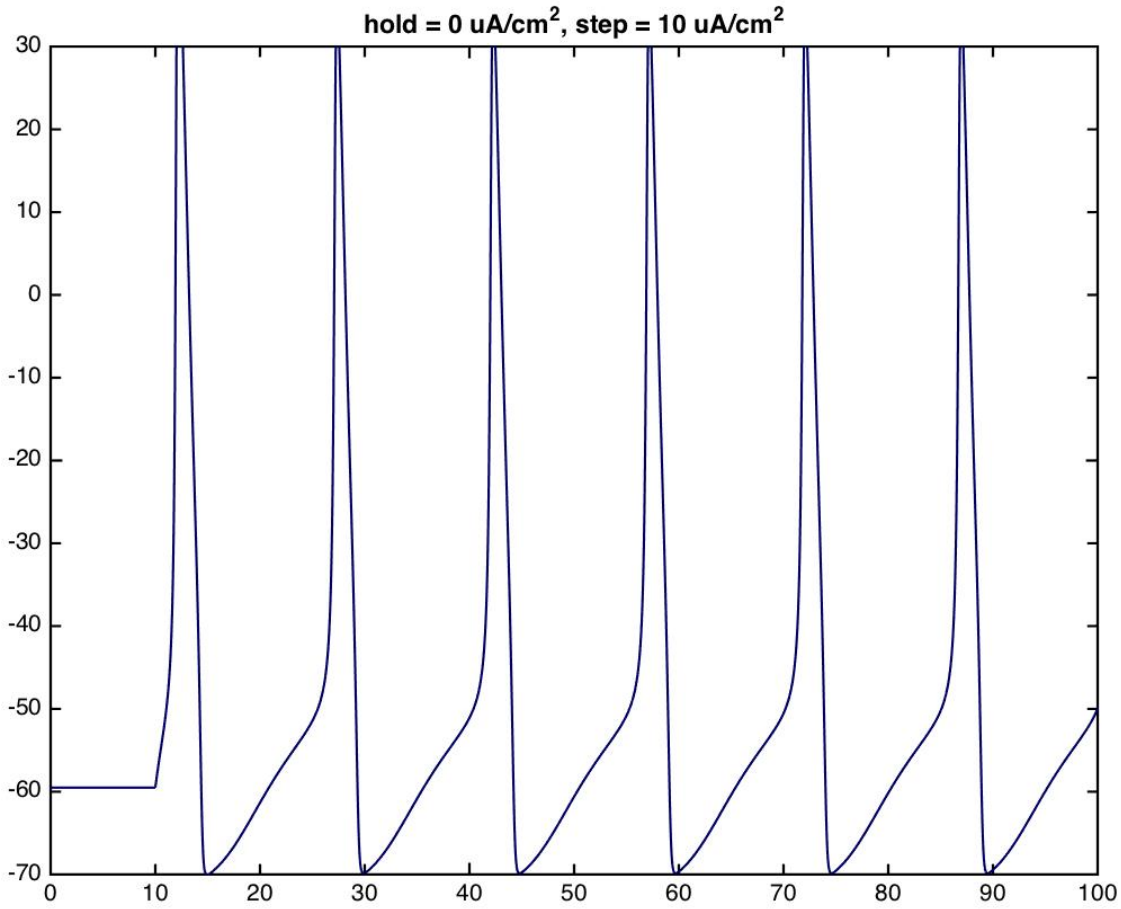



Figure: Simulated train of repeating potentials.

Finding train frequency

We perform a simple FFT of the $V_m$ for different current steps, check out these pictures

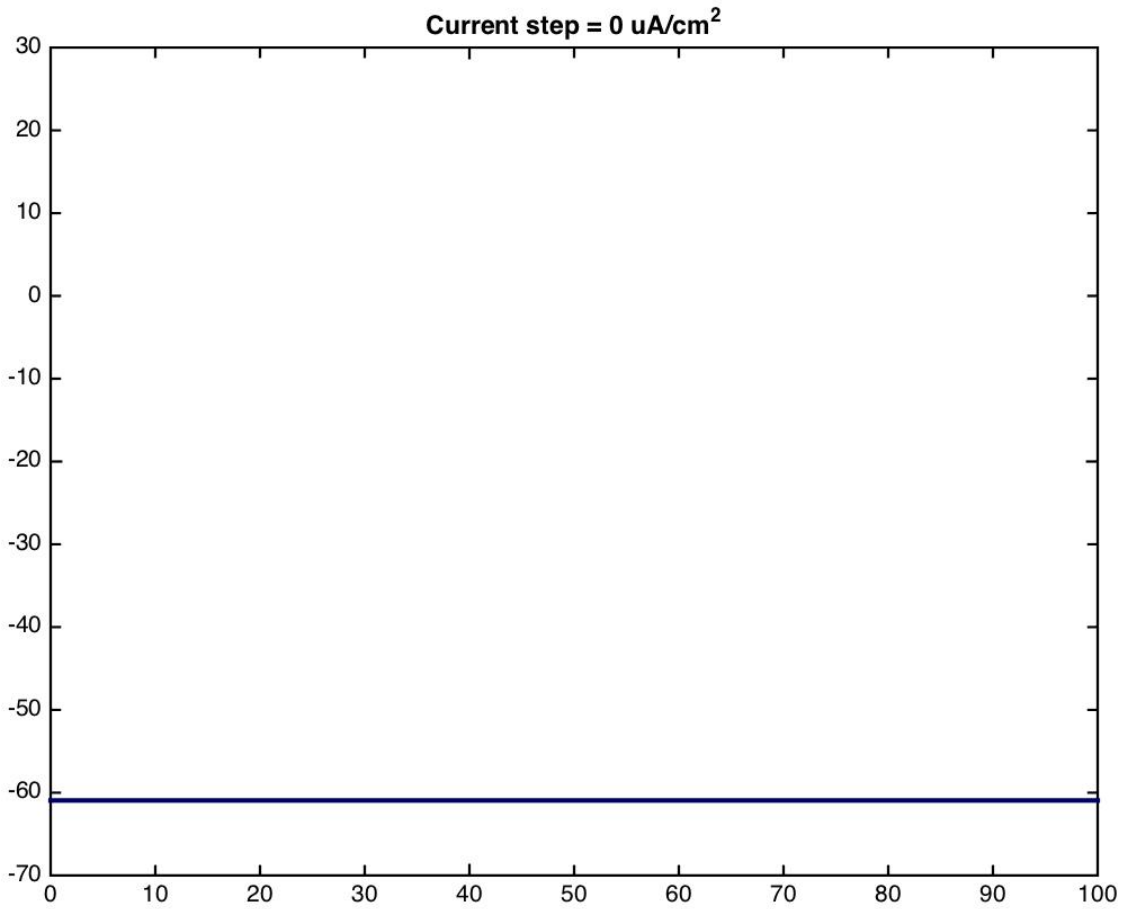
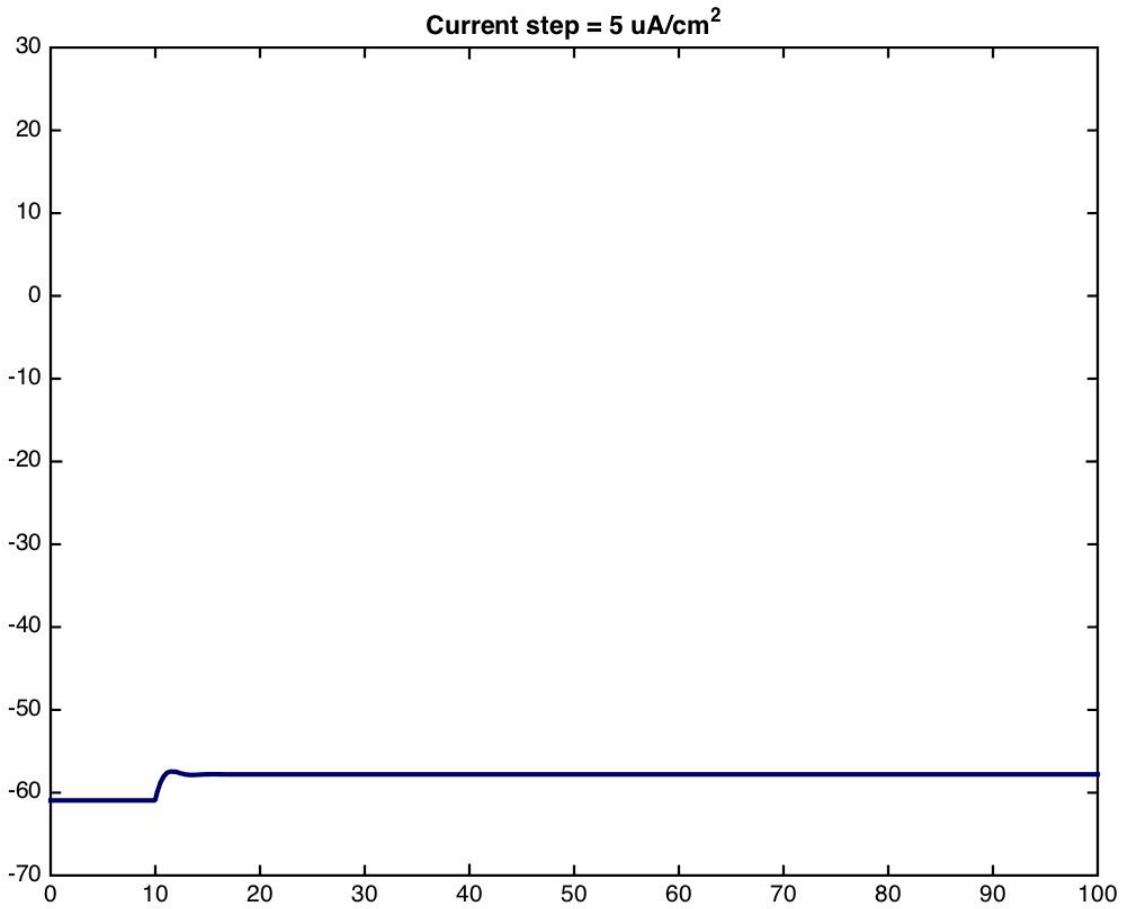



Figure: HH Models step current response starting at 0 $\mu A/cm^2$



A constant current applied to the HH model produces a train of action potentials.

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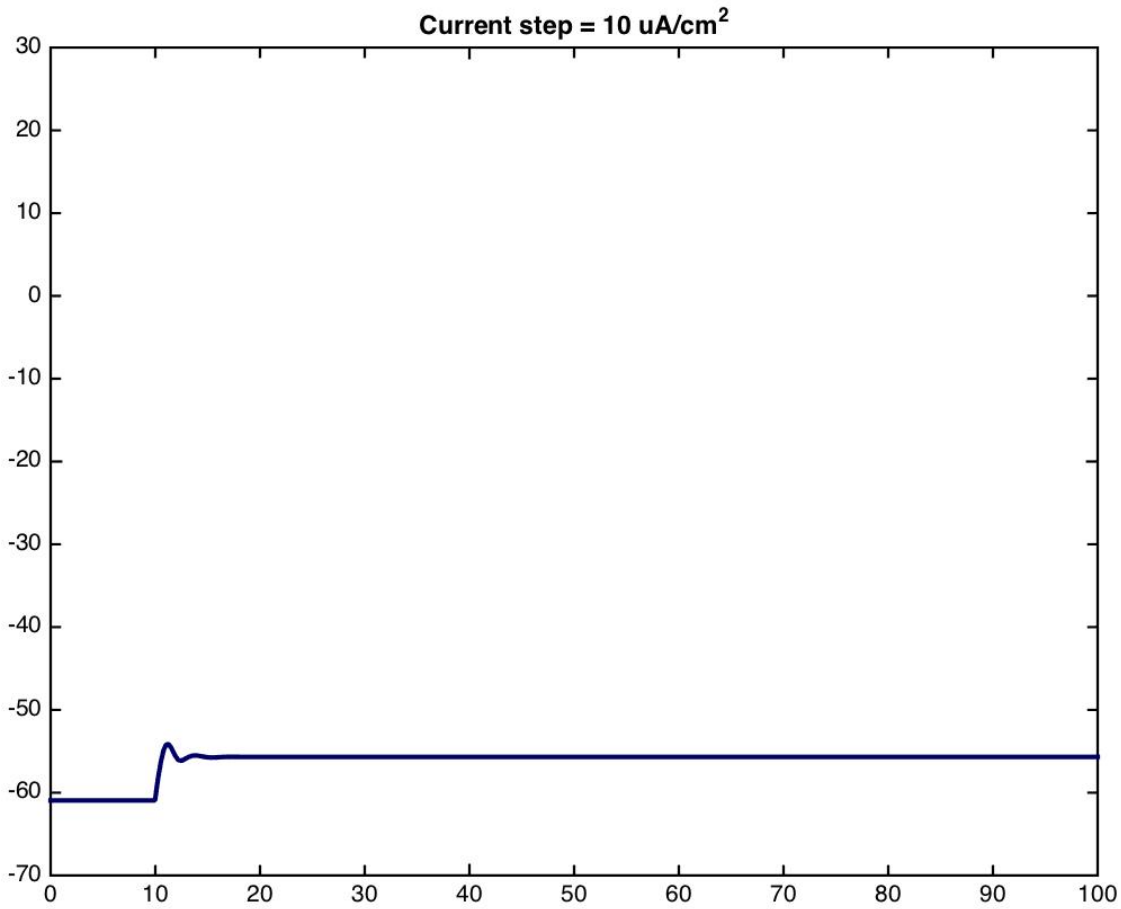


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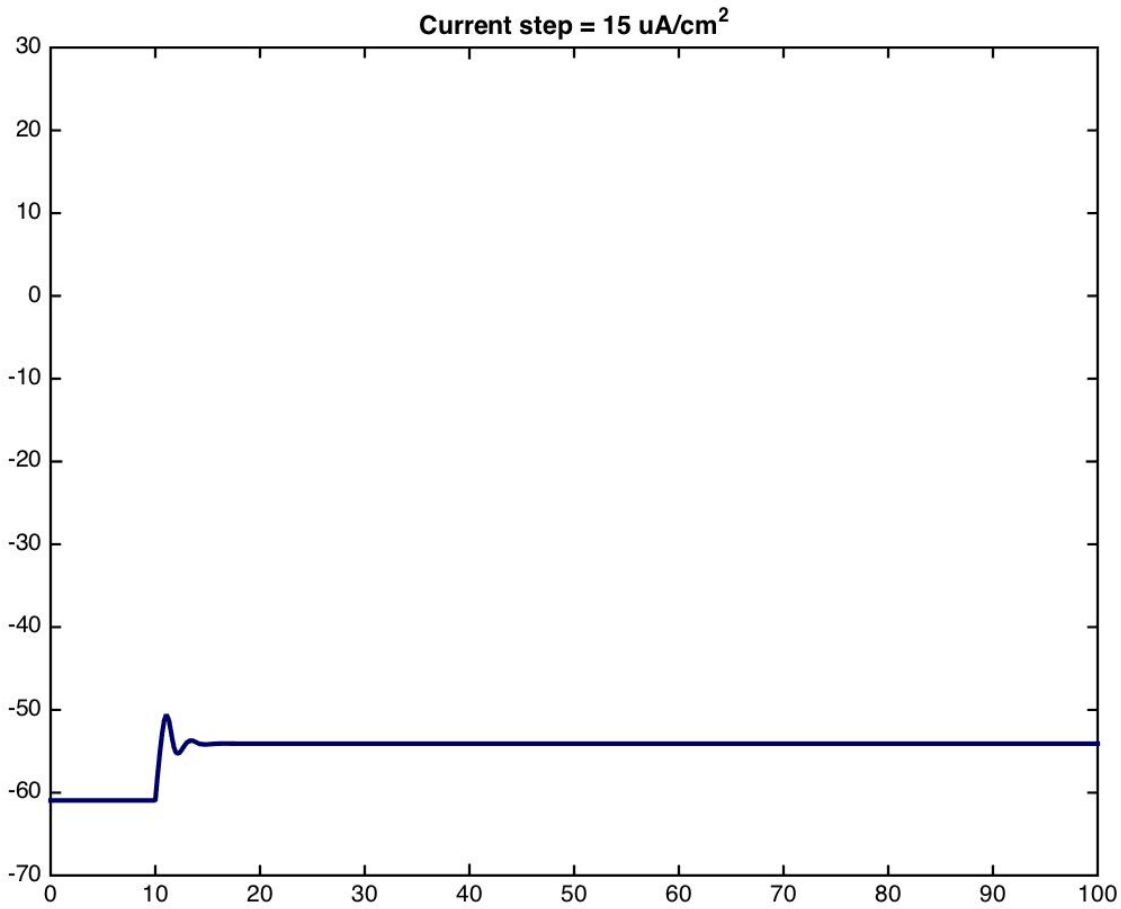


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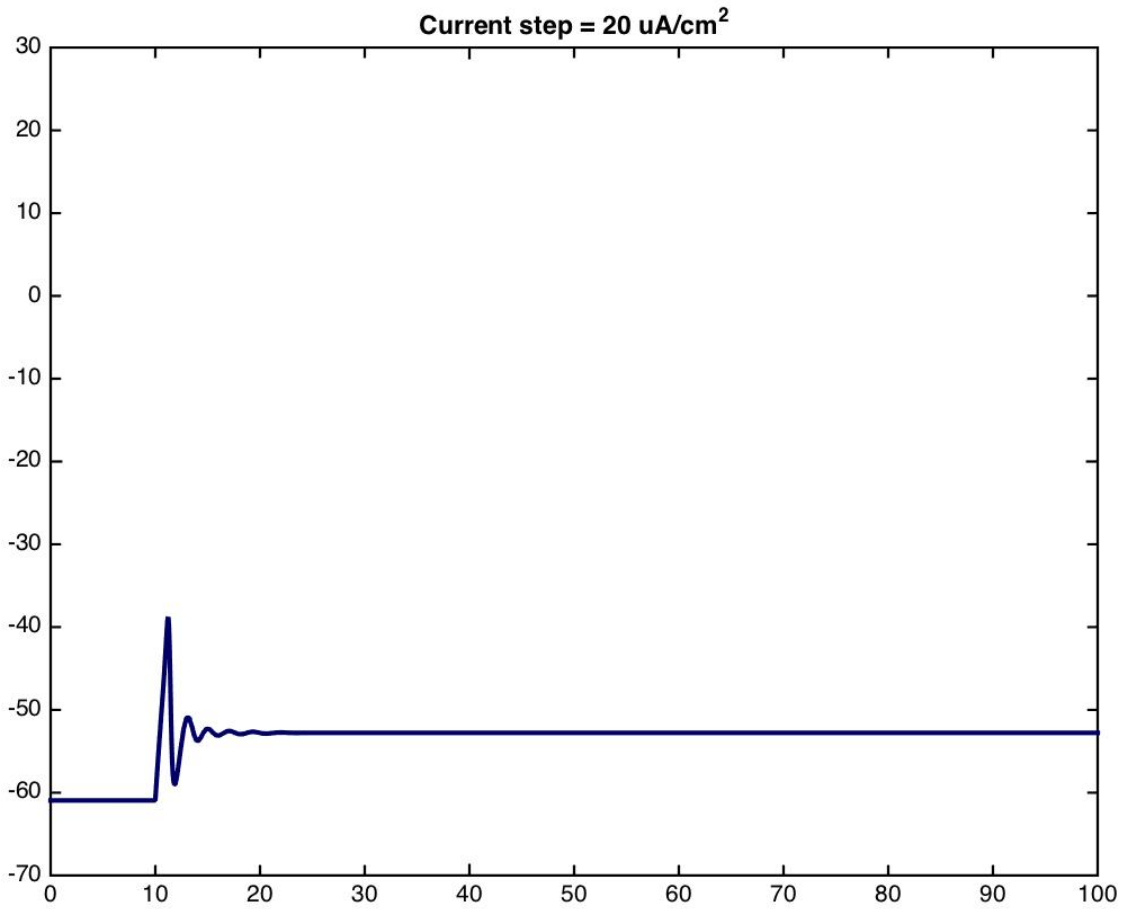


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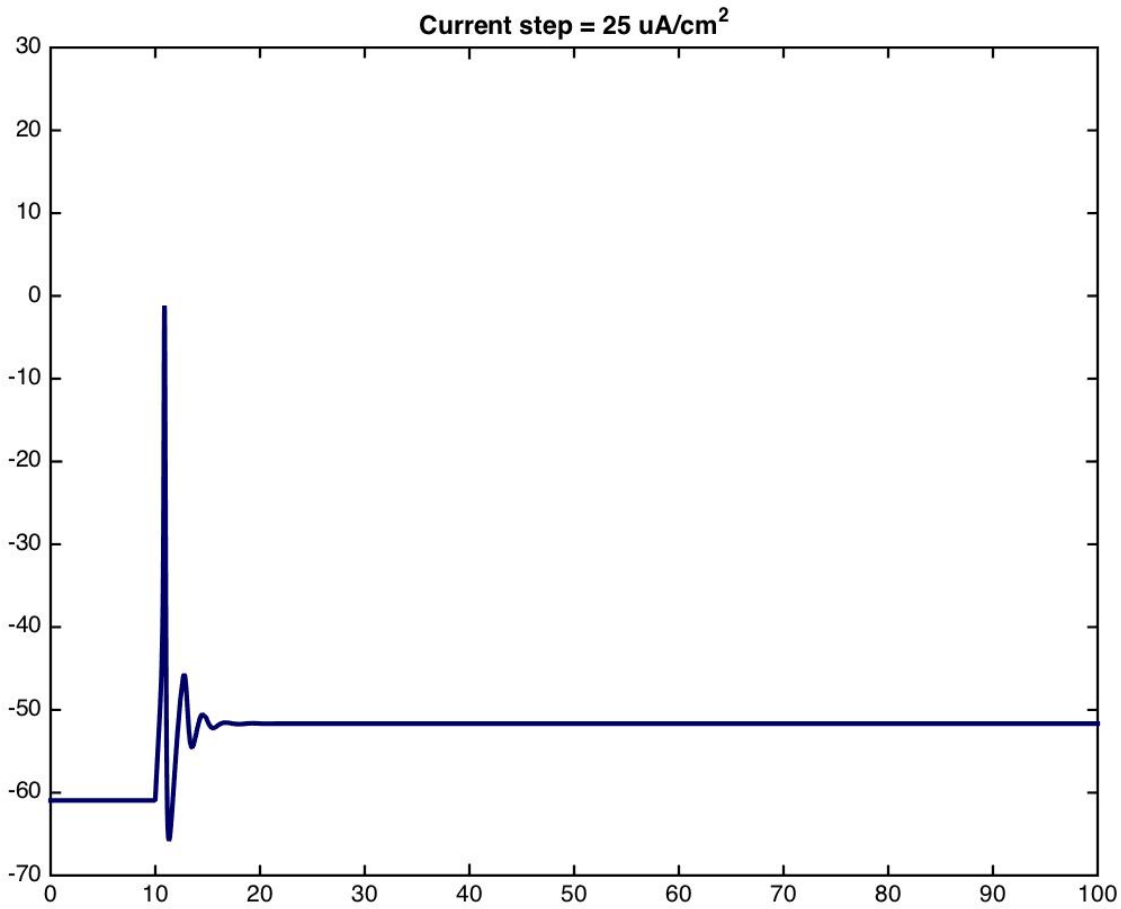


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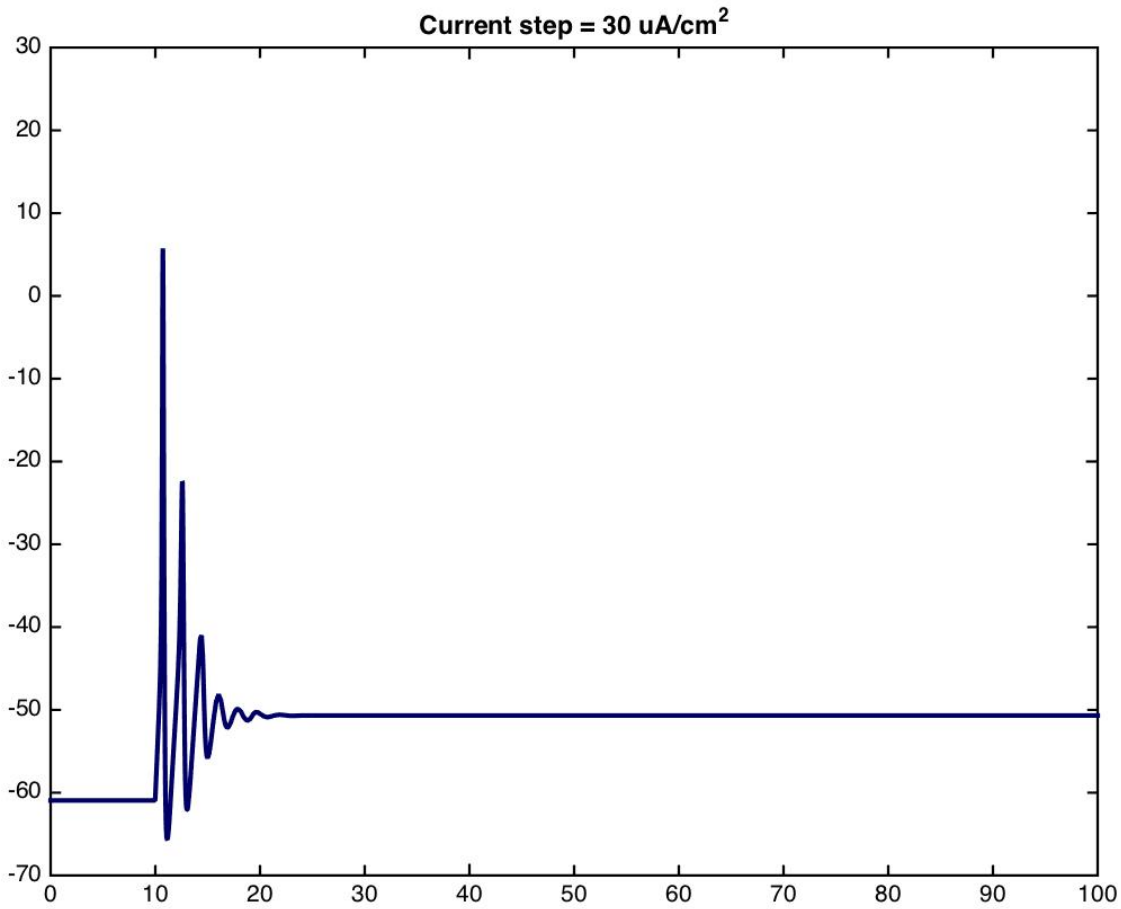


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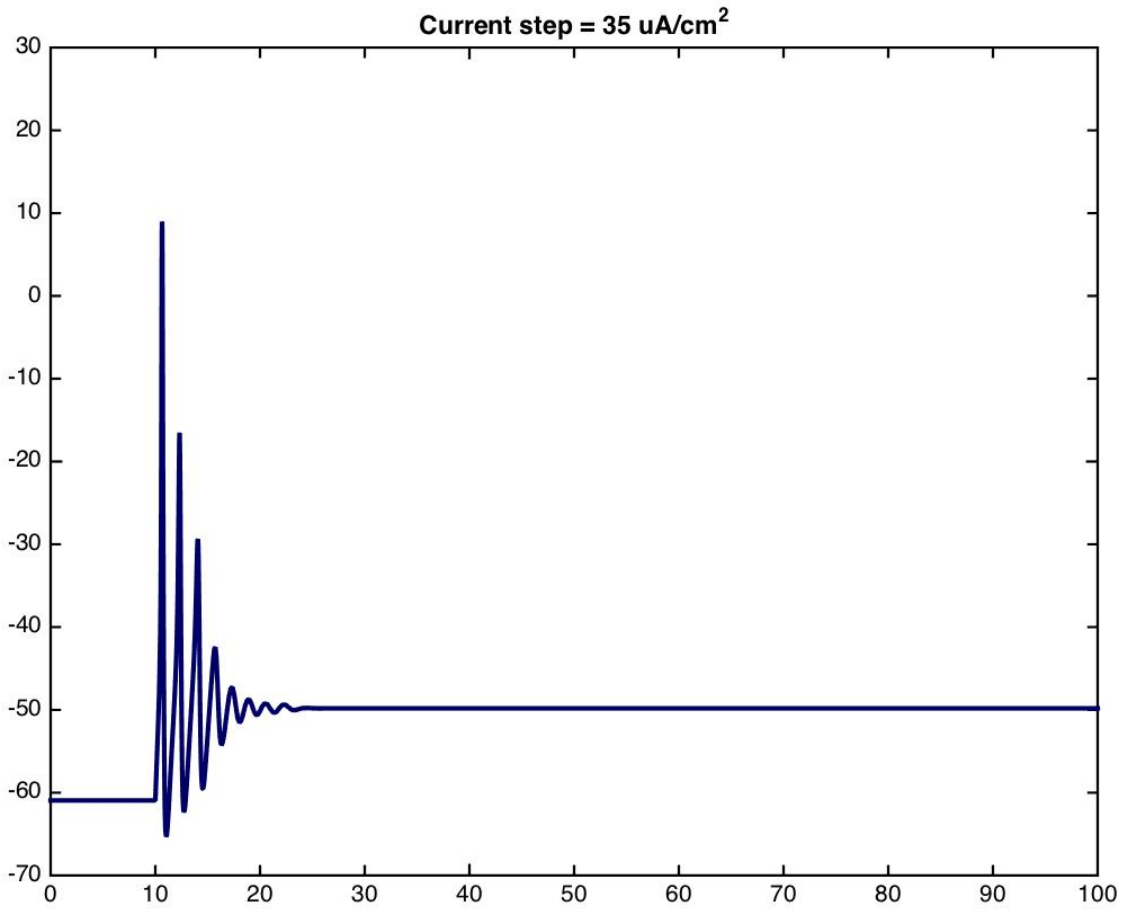


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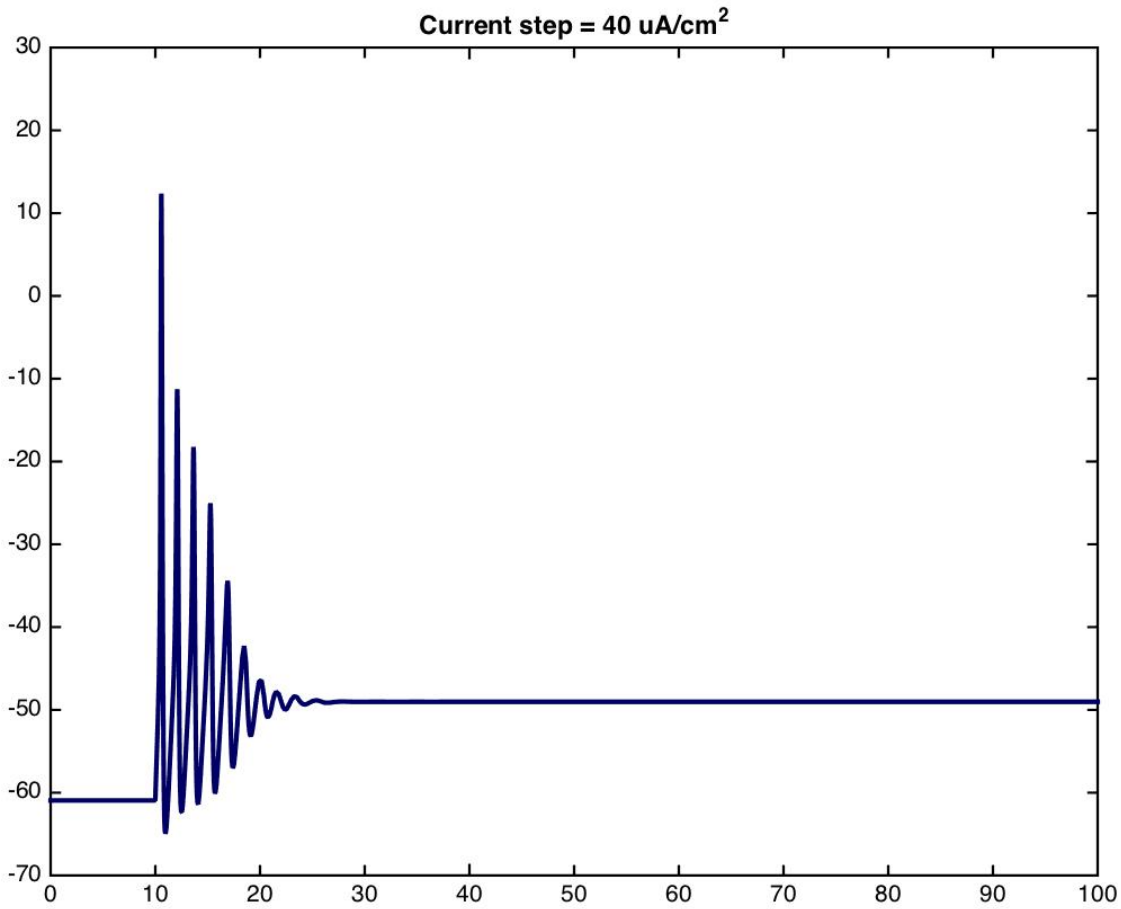


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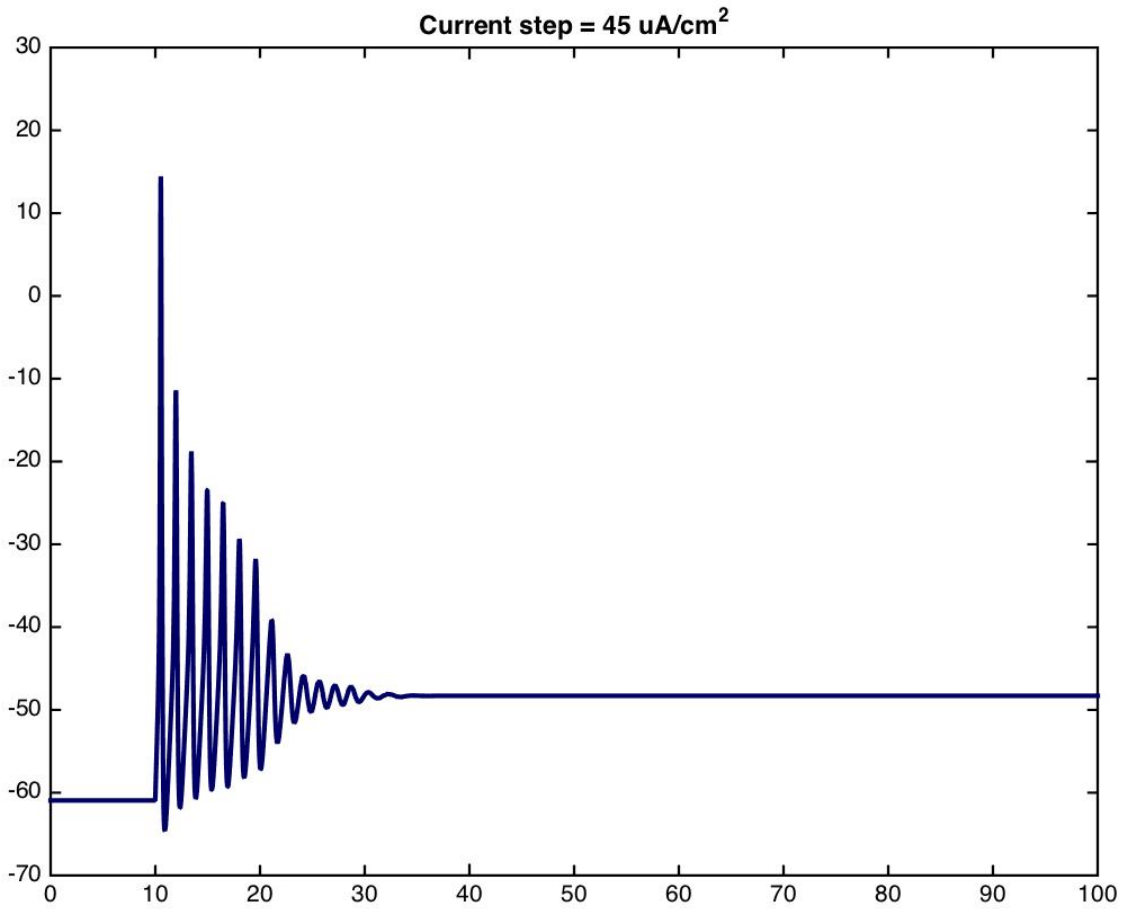


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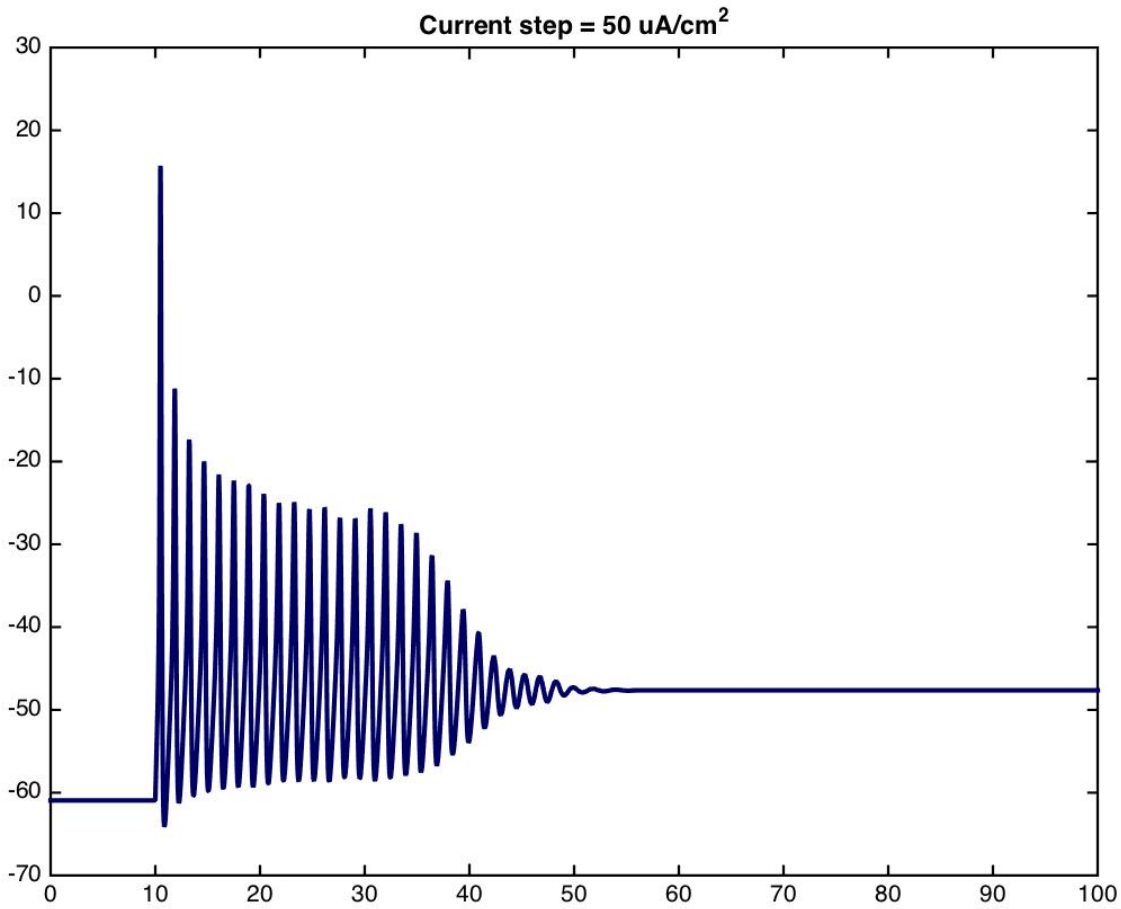


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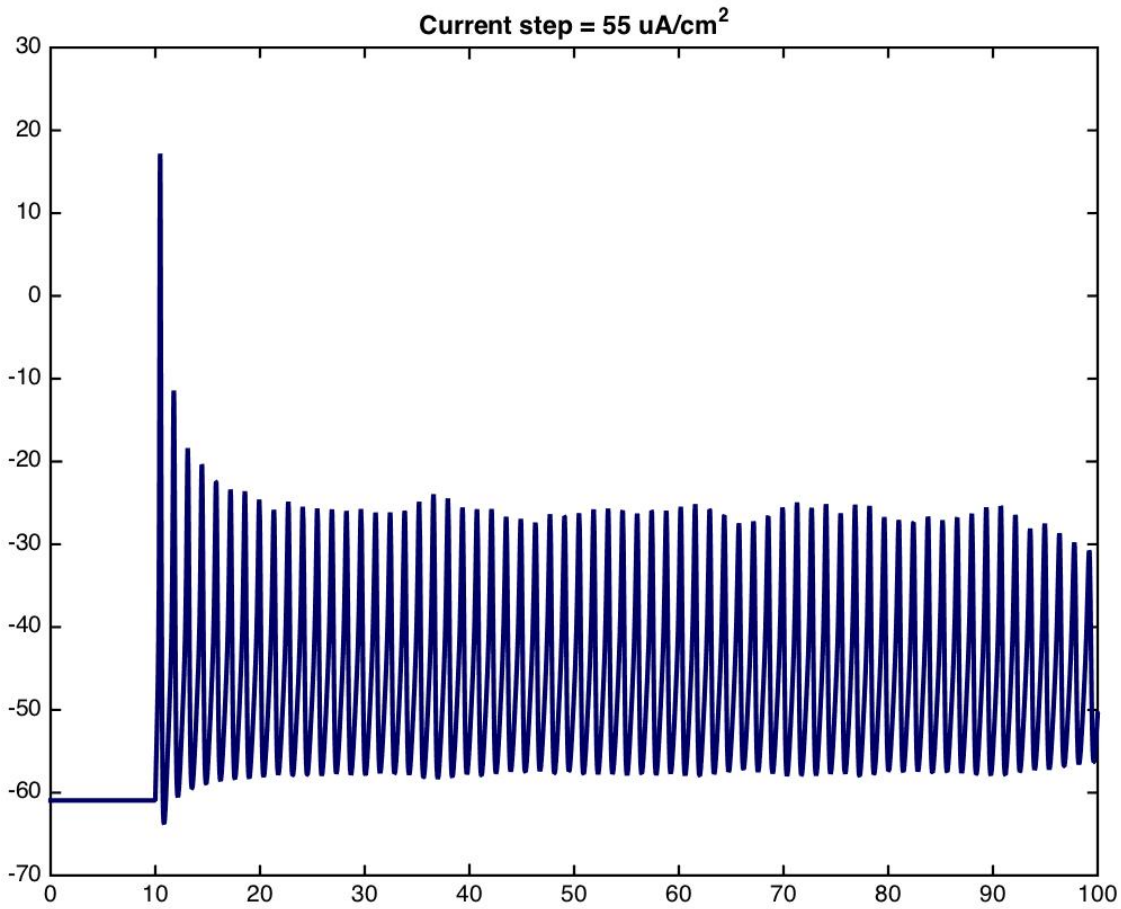
A constant current applied to the HH model produces a train of action potentials.

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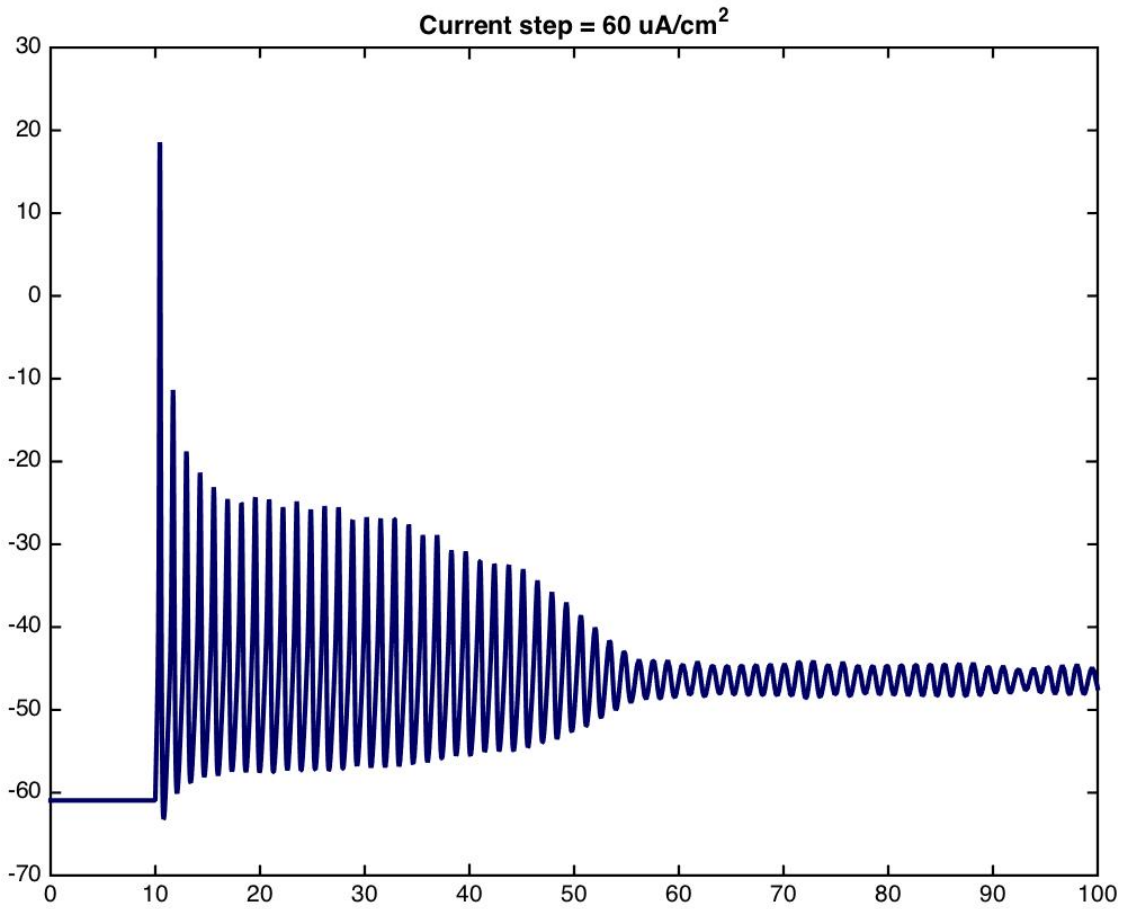


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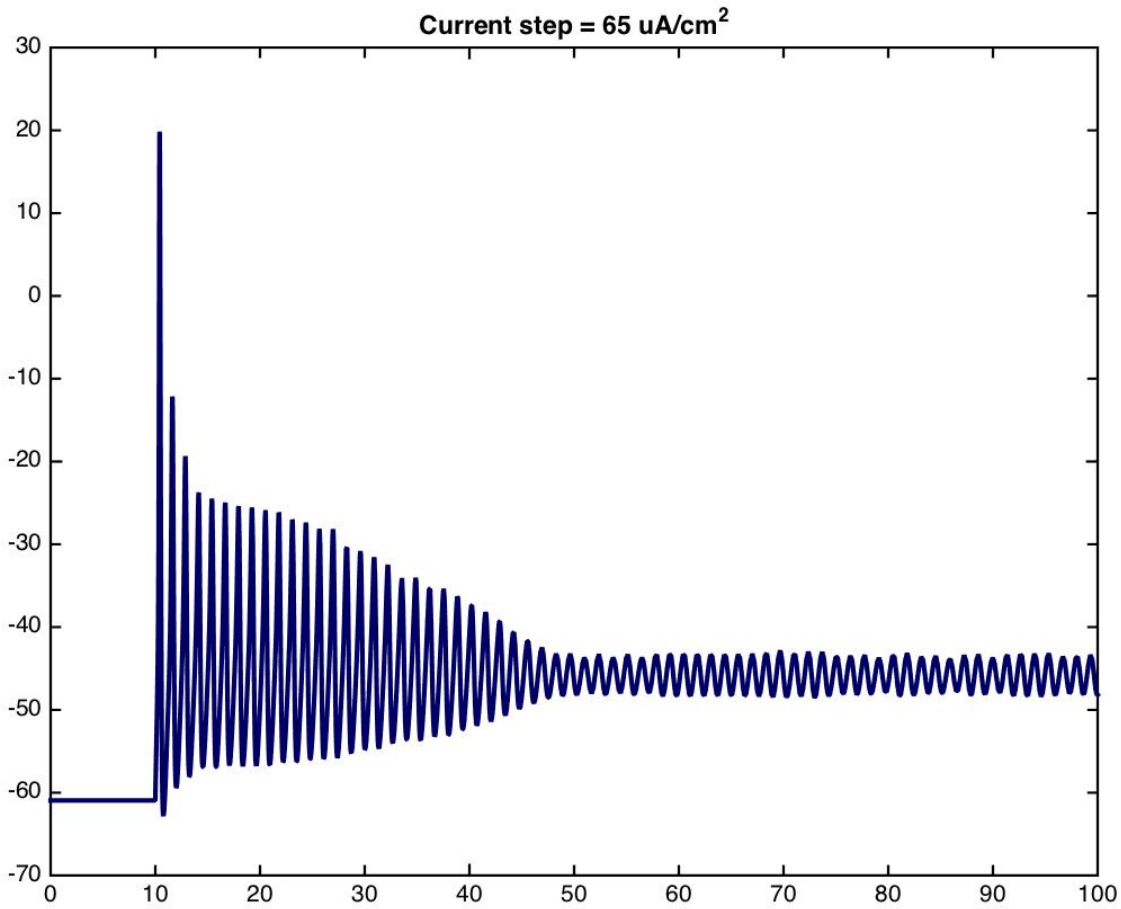


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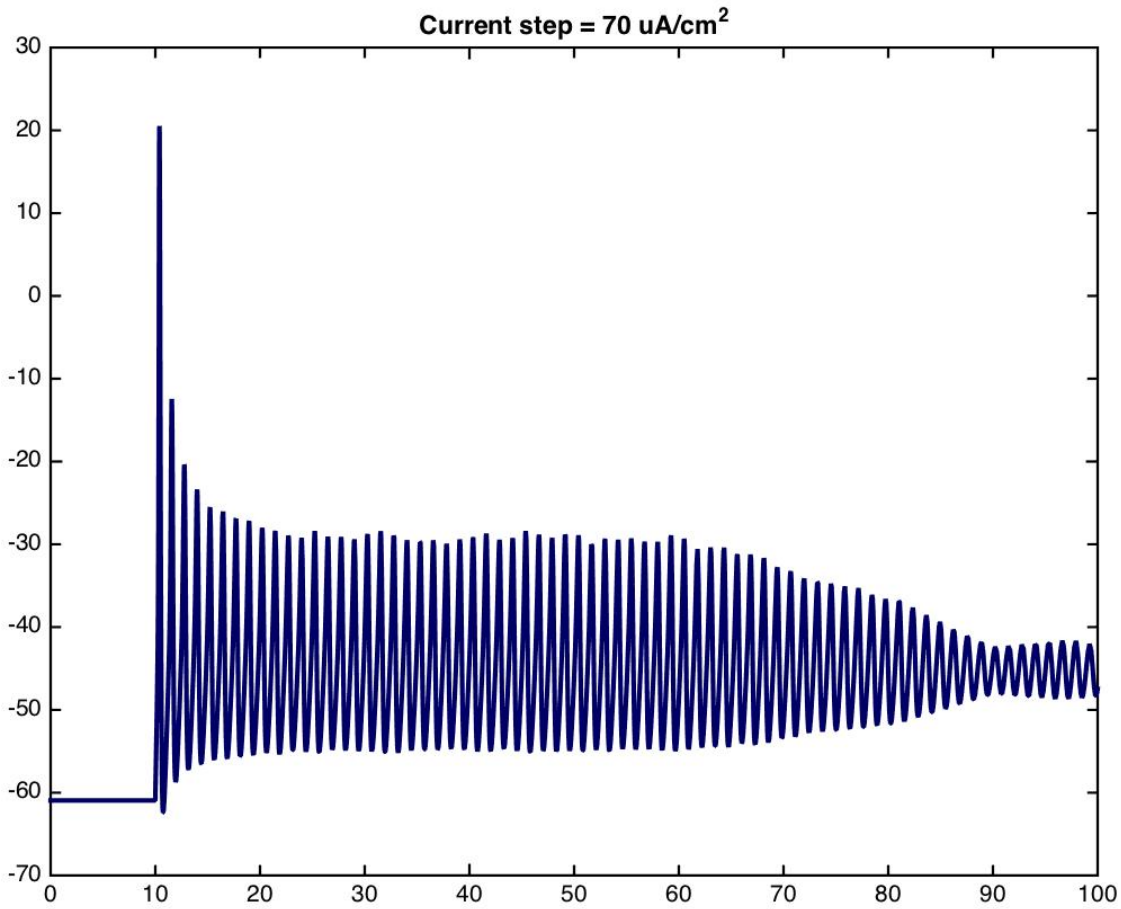


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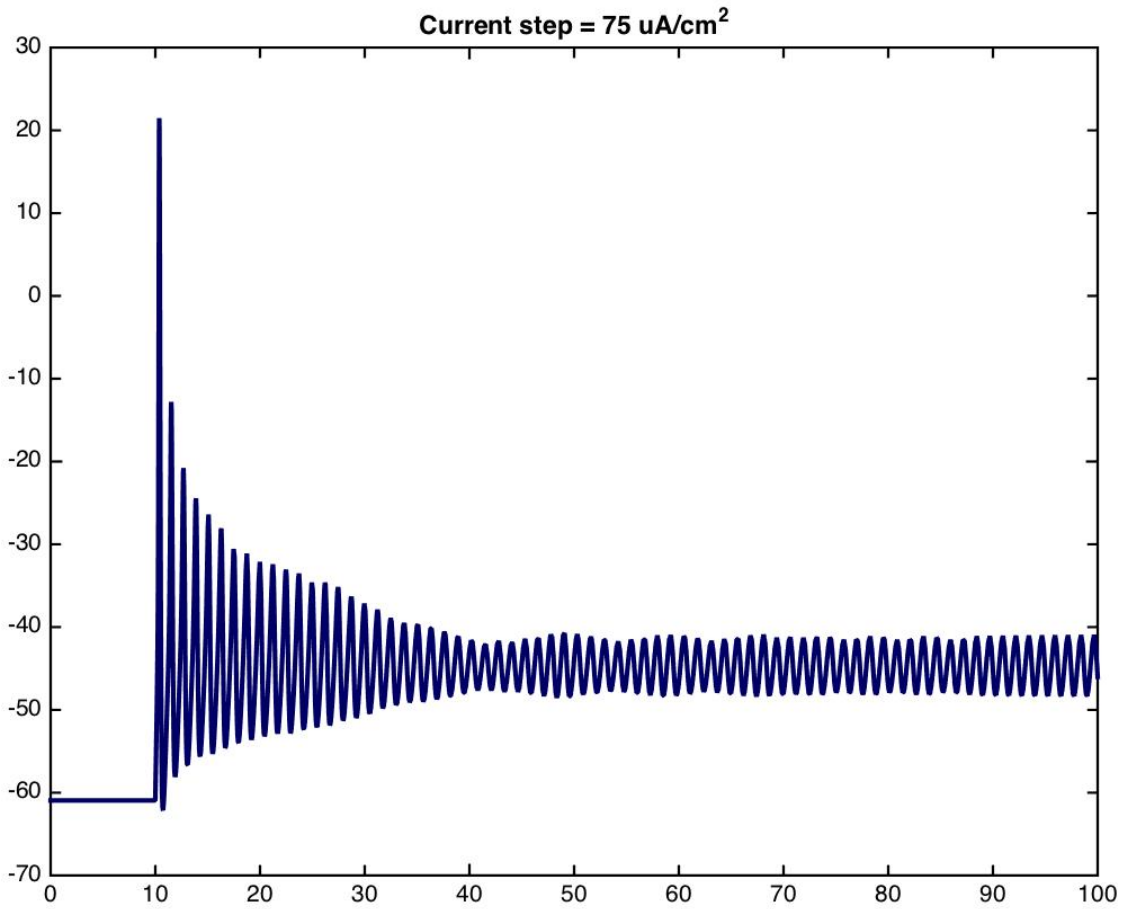


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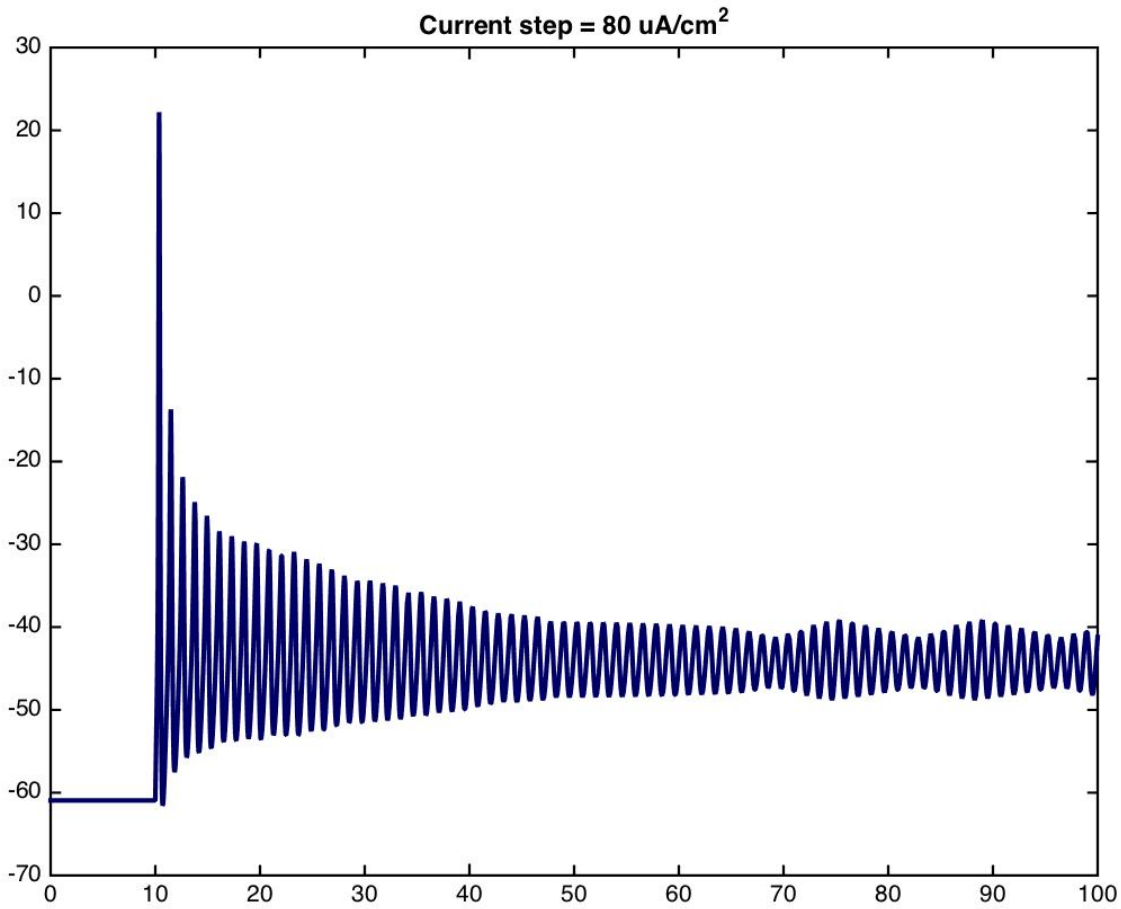


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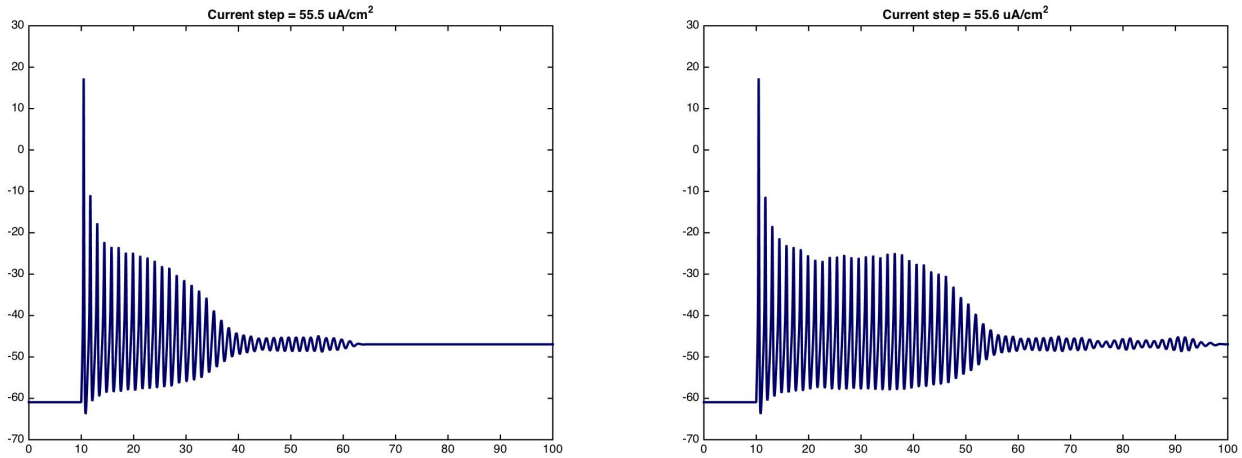


Figure: Unpredictable behavior at high current



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# References


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2. Weiss, T. F. (1995).Cellular Biophysics. Volume 2: Electrical Properties, MIT Press.
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