
Q1 AEF neuron driven by a synapse receiving Poisson stimulus

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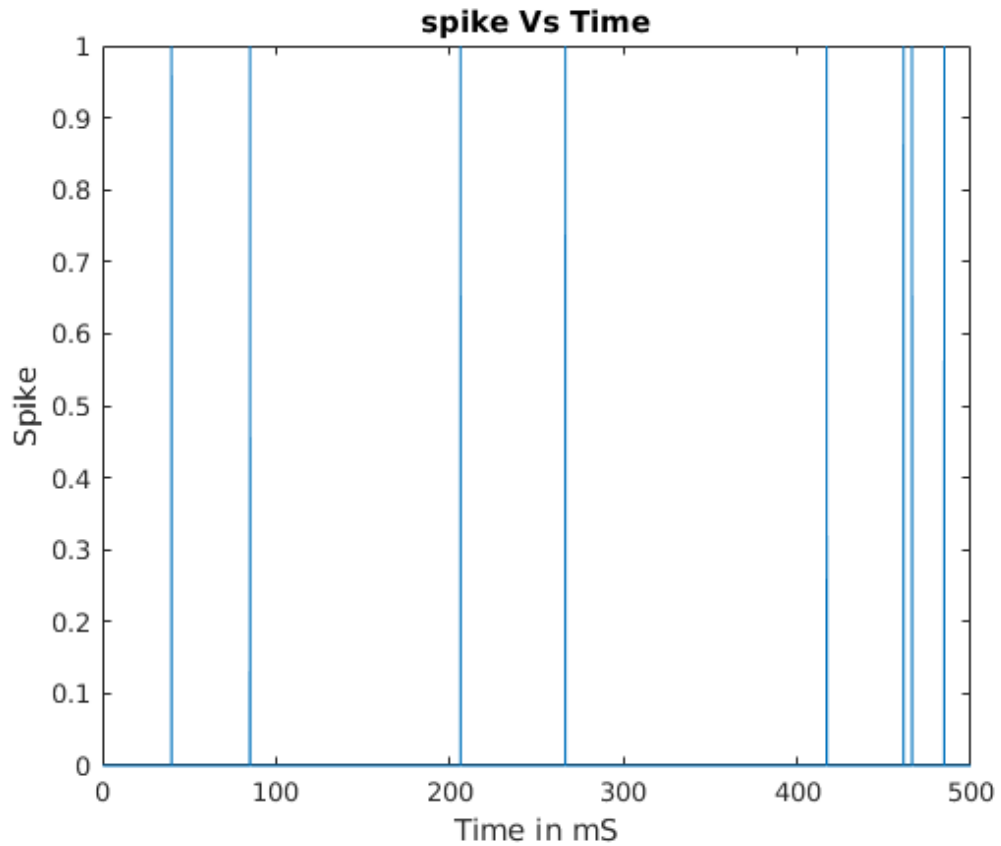
Q1 Part-A Poisson Stimulus

```
seed=100;
rng(seed)
ms=1E-3;

T=500*ms;
delta_t=0.1*ms;
steps=T/delta_t;
lambda=10;
t=0:delta_t:T;

myPoissonSpikeTrain = rand(1, steps) < lambda*delta_t;

figure();
plot(t(2:end)*1E3,myPoissonSpikeTrain);
xlabel('Time in mS');ylabel('Spike');
title('spike Vs Time');
```



Q1 Part-B Synapse Current

```
Io=1E-12;  
We=500;  
tau=15*ms;  
taus=tau/4;  
t=0:delta_t:T;  
tm=find(myPoissonSpikeTrain==1)*0.1*ms;  
i_matrix=zeros(size(tm,2),size(t,2));  
  
Iapp=zeros(size(t));  
  
for j=1:size(t,2)  
    temp=0;  
    for i=1:size(tm,2)  
        if (t(j)>tm(i))  
            temp=temp+exp((tm(i)-t(j))/tau)-exp((tm(i)-t(j))/taus);  
        end  
    end  
  
    Iapp(j)=temp;
```

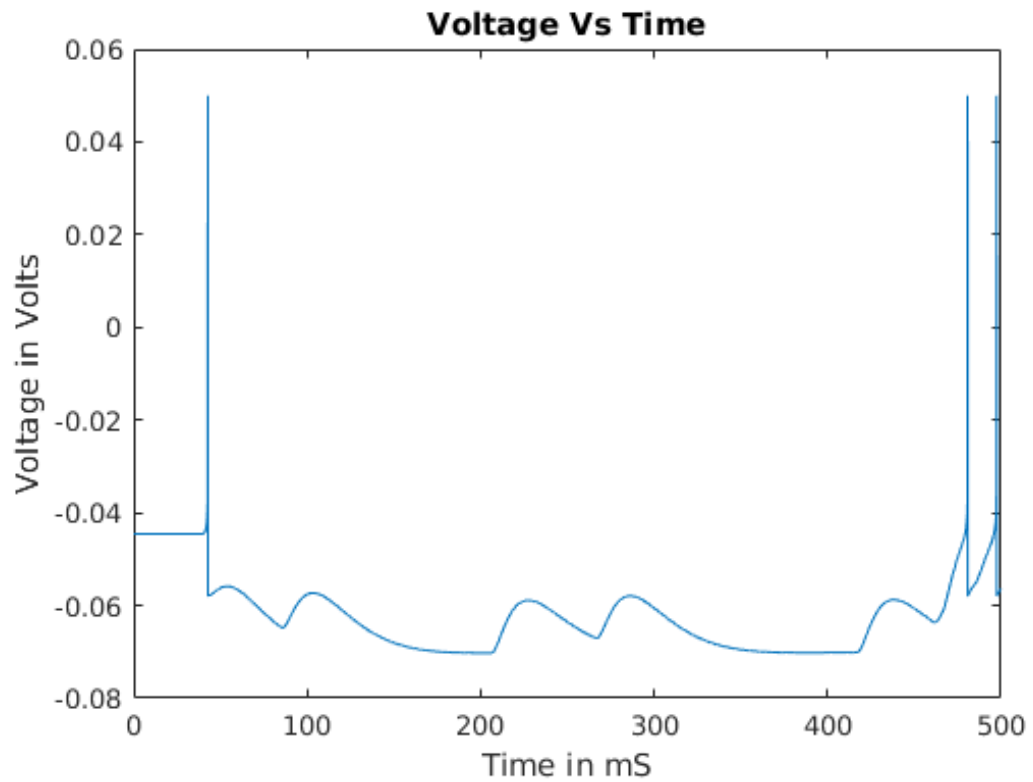
```
end

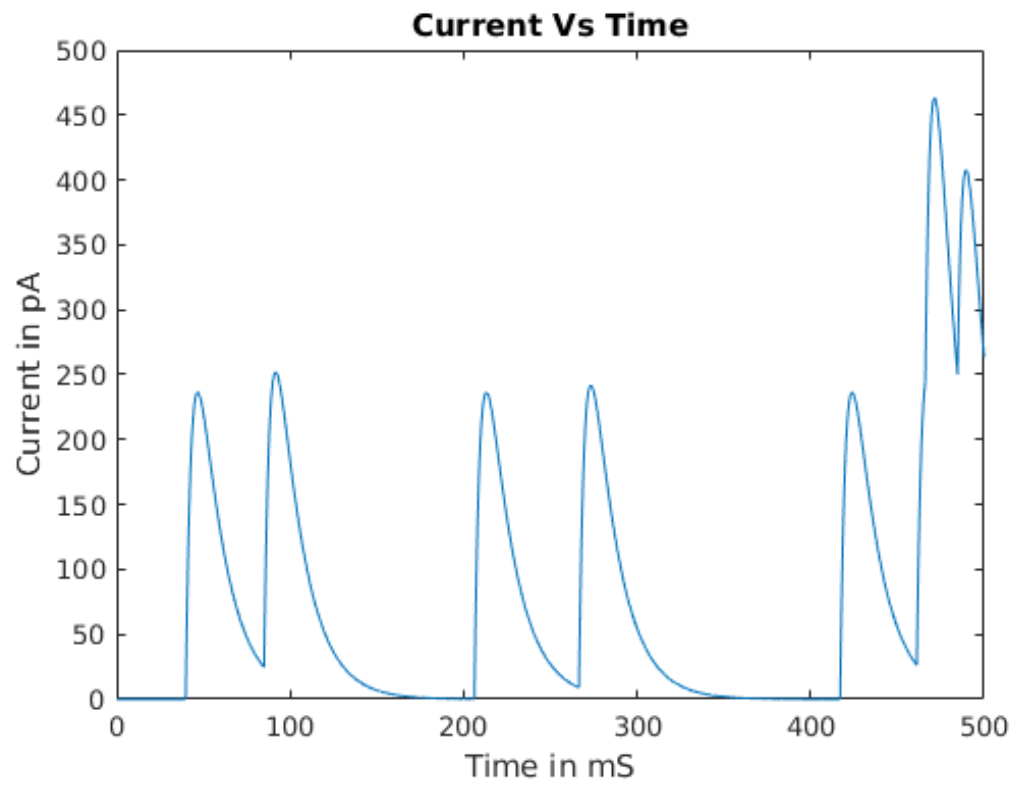
Iapp=Io*We*Iapp;

[V,U] = AEF(delta_t,T,Iapp,1);

figure();
plot(t*1E3,V);
xlabel('Time in mS');ylabel('Voltage in Volts');
title('Voltage Vs Time');

figure();
plot(t*1E3,Iapp*1E12);
xlabel('Time in mS');ylabel('Current in pA');
title('Current Vs Time');
```





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