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```
function main
```

```
% % % % % % % % % % % % % % % % % % % % % %
```

Parameters: nM

```
% % % % % % % % % % % % % % % % % % %
```

```
kadenyl=31.33;  
a=313;  
koni=0:.0001:.01;  
l=249;  
konl=.004;  
kona=.005;  
ii=25;  
kcat=2.88;  
dark=521;  
deg=0.000136;  
tspan=0:.01:80;
```

```
% % % % % % % % % % % % % % % % % % %
```

Simulations

```
% % % % % % % % % % % % % % % % % % %
```

```
E=50;  
LH2AMP=15;  
result = zeros(8001,101);  
for j=1:101  
    Xol=[E 0 0 0 0 0 0 LH2AMP 0];  
    options=odeset('RelTol',1e-6);%free=0;  
  
    [t,x1]=ode15s(@lucif,tspan,Xol,options,kadenyl,kcat,deg,a,l,ii,dark,kona,konl,kon  
    result(:,j)=x1(:,9);
```

```

end
% % % % % % % % % % % % % % % % % % % % % %

```

3D Plot

```

% % % % % % % % % % % % % % % % % %

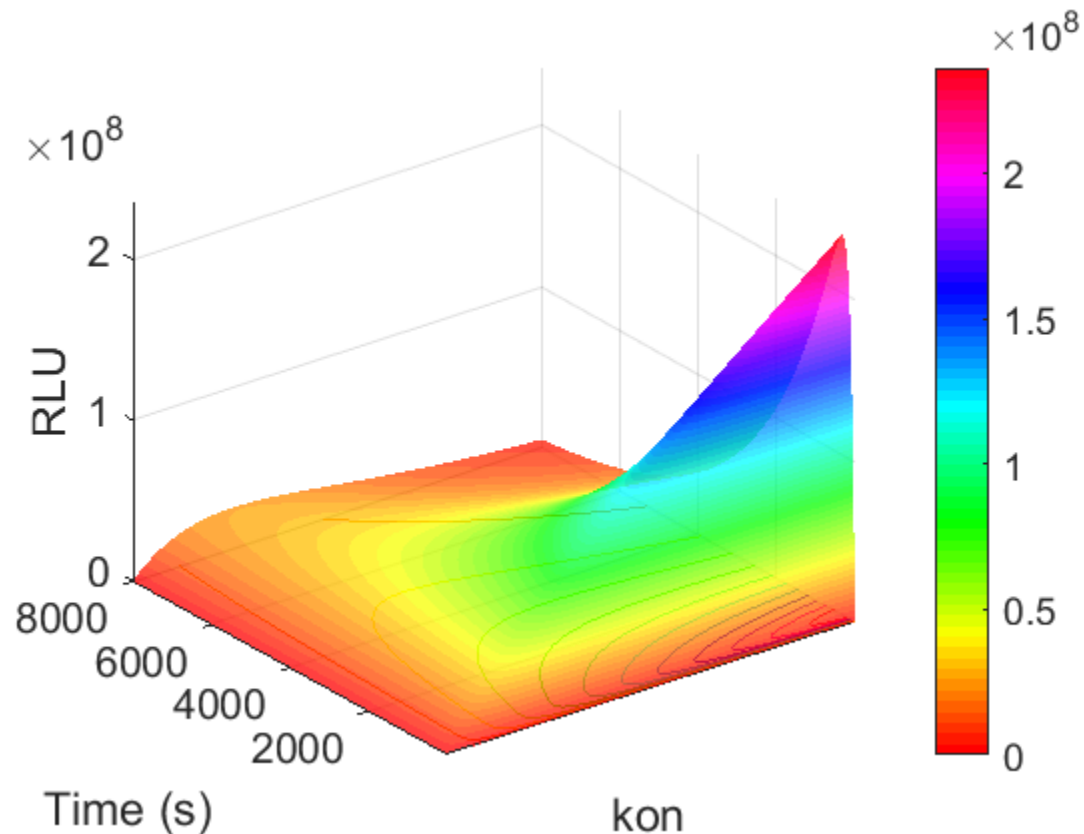
```

surface and contour plot

```

figure(1)
colormap hsv
s=surfc(result,'FaceAlpha',0.75);
colorbar
set(gca,'fontsize',16,'FontName','Helvetica');
set(gcf,'color','w')
set(gca,'xtick',[])
shading interp
ylabel('Time (s)')
xlabel('kon')
zlabel('RLU')

```



contour plot only

```

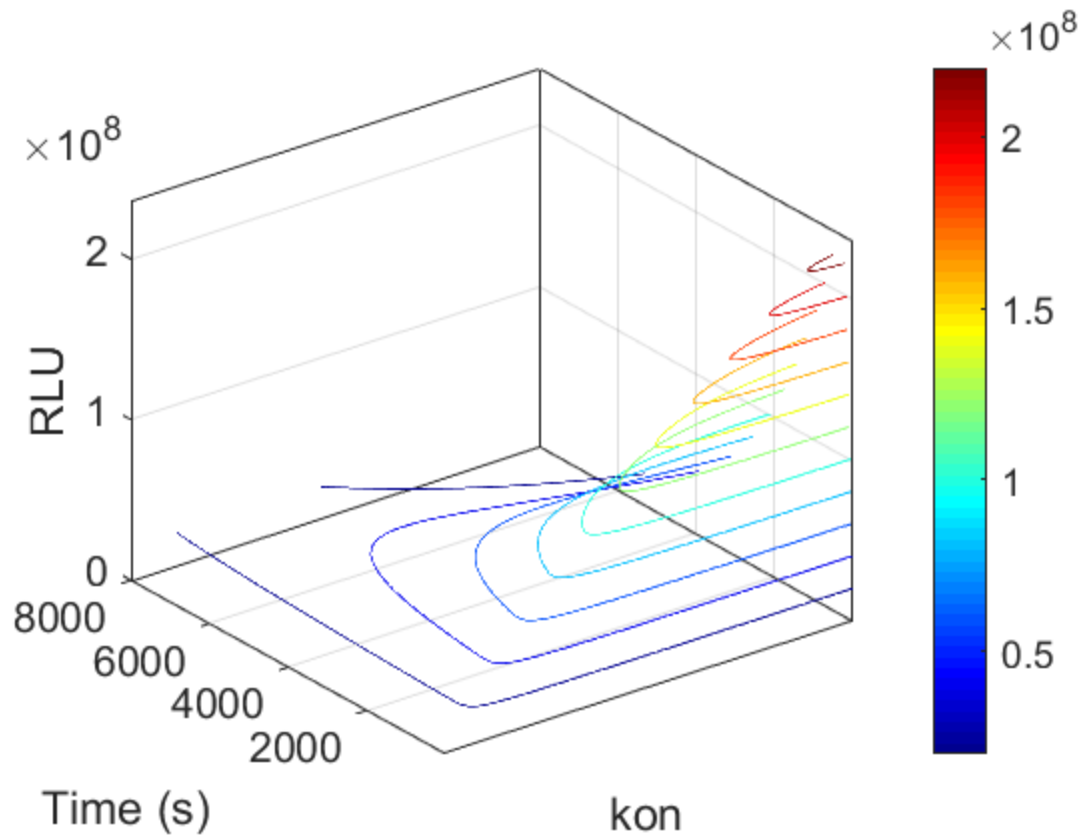
figure(2)

```

```

colormap jet
g=contour3(result);
colorbar
set(gca,'fontsize', 16,'FontName','Helvetica');
set(gcf,'color','w')
set(gca,'xtick',[])
ylabel('Time (s)')
xlabel('kon')
zlabel('RLU')

```

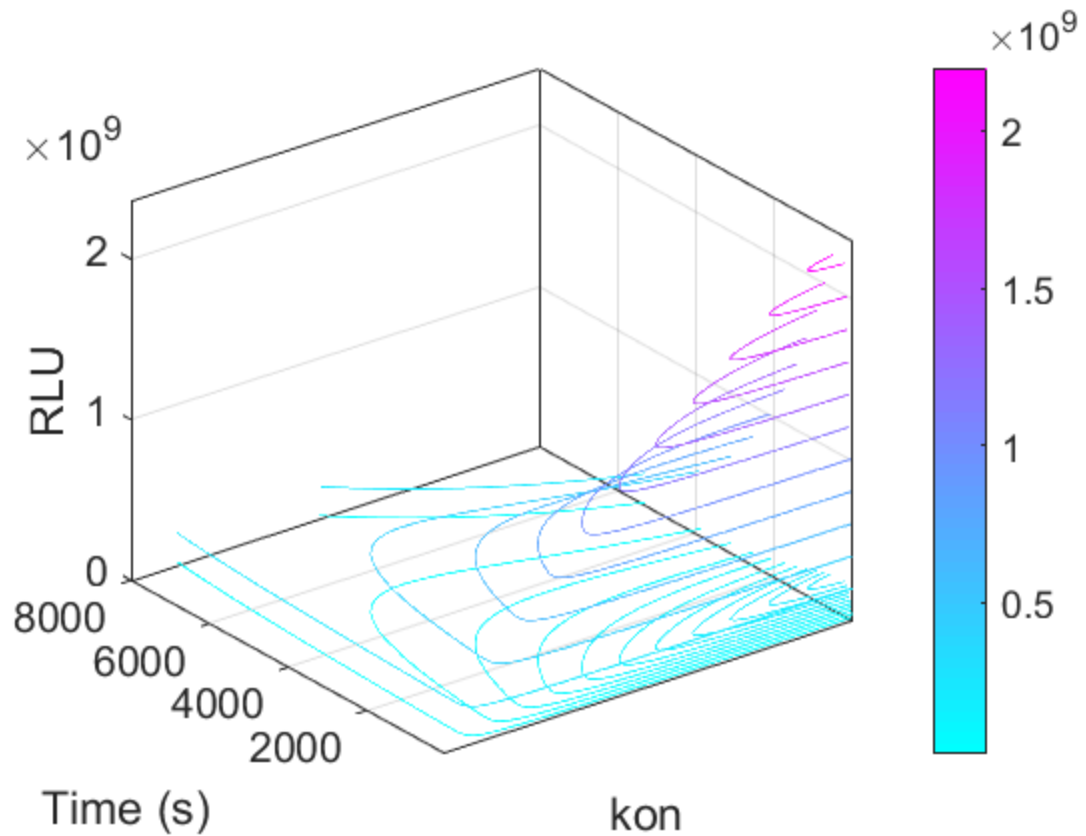


layer multiple contour plots

```

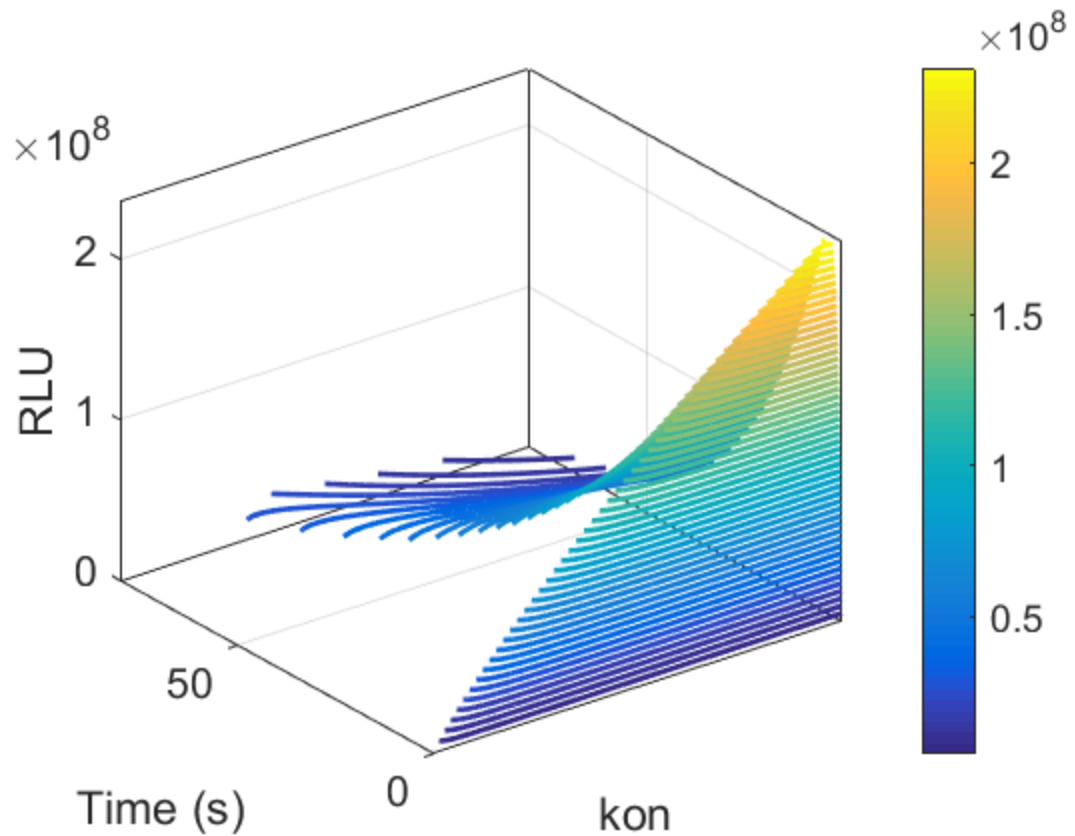
figure(3)
colormap cool
g=contour3(result);hold on
g=contour3(result*10);
colorbar
set(gca,'fontsize', 16,'FontName','Helvetica');
set(gcf,'color','w')
set(gca,'xtick',[])
ylabel('Time (s)')
xlabel('kon')
zlabel('RLU')

```



interpolation

```
figure(4)
[X,Y]=meshgrid(koni,tspan);
[M,c]=contour3(X,Y,result,50);
colorbar
c.LineWidth = 2;
set(gca,'fontsize', 16,'FontName','Helvetica');
set(gcf,'color','w')
set(gca,'xtick',[])
ylabel('Time (s)')
xlabel('kon')
zlabel('RLU')
```



heatmap

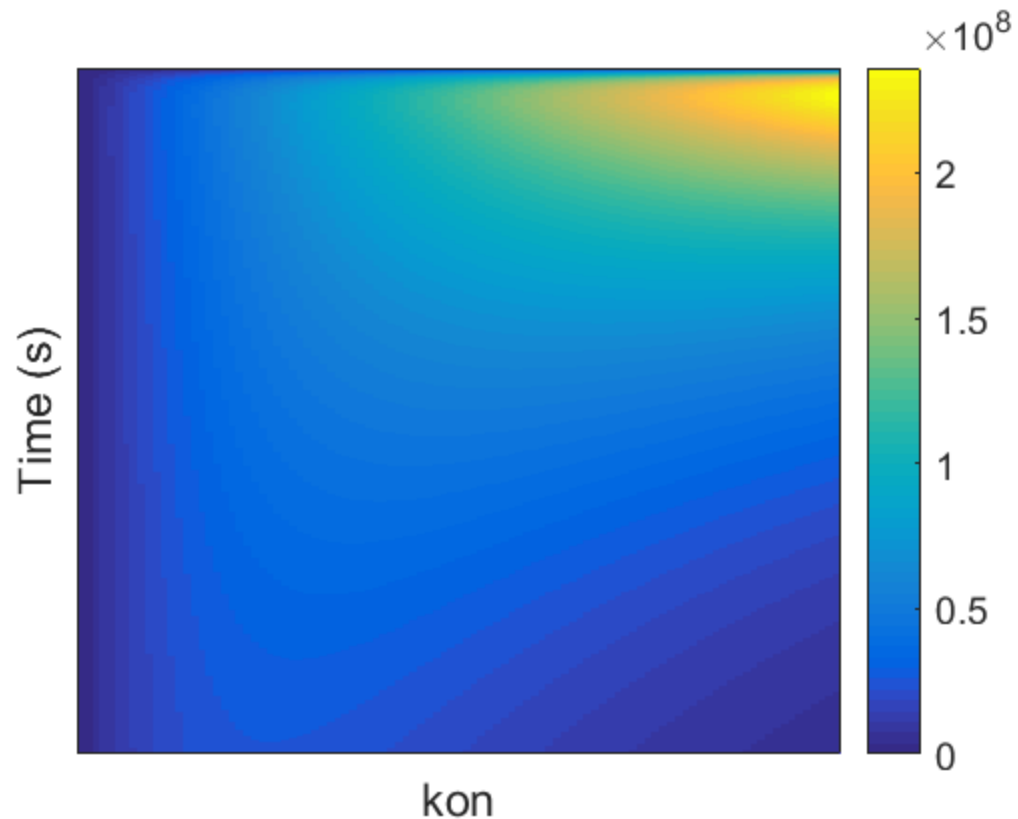
```
figure(5)
heatmap(result)
colorbar
set(gca, 'fontsize', 16, 'FontName', 'Helvetica');
set(gcf, 'color', 'w')
set(gca, 'xtick', [])
ylabel('Time (s)')
xlabel('kon')
zlabel('RLU')
```

ans =

Image with properties:

```
      CData: [8001x101 double]
  CDataMapping: 'scaled'
```

Use GET to show all properties



heatmap but change range of colormap

```
figure(6)
heatmap(result)
colorbar
lim = caxis
caxis([.3*lim(2) lim(2)])
set(gca, 'fontsize', 16, 'FontName', 'Helvetica');
set(gcf, 'color', 'w')
set(gca, 'xtick', [])
ylabel('Time (s)')
xlabel('kon')
zlabel('RLU')
return
```

ans =

Image with properties:

*CData: [8001x101 double]
 CDataMapping: 'scaled'*

Use GET to show all properties

```
lim =
```

```
1.0e+08 *
```

```
0      2.3602
```

```
function [dx_dt] =
```

```
lucif(t,x,kadenyl,kcat,deg,aa,ll,ii,dark,kona,konl,koni)
```

equations

free luciferase

```
dx_dt(1) = -kona*x(1)*x(6) + aa*x(2) -konl*x(1)*x(7) + ll*x(3) -  
koni*x(1)*x(8) + ii*x(5)-deg*x(1)+kcat*x(5);
```

```
%L:a
```

```
dx_dt(2)= kona*x(1)*x(6) - aa*x(2) - konl*x(2)*x(7) + ll*x(4) ;
```

```
%L:l
```

```
dx_dt(3)= konl*x(1)*x(7) - ll*x(3) -kona*x(3)*x(6) + aa*x(4);
```

```
%L:l & a
```

```
dx_dt(4)= konl*x(2)*x(7) - ll*x(4) +kona*x(3)*x(6) - aa*x(4) -  
kadenyl*x(4);
```

```
%L:i
```

```
dx_dt(5)=kadenyl*x(4) + koni*x(1)*x(8) - ii*x(5) -kcat*x(5);
```

```
% atp
```

```
dx_dt(6)=-kona*x(1)*x(6) + aa*x(2) -kona*x(3)*x(6) + aa*x(4);
```

```
% lh2
```

```
dx_dt(7)= -konl*x(1)*x(7) + ll*x(3) - konl*x(2)*x(7) + ll*x(4);
```

```
%intermediate / lh2amp
```

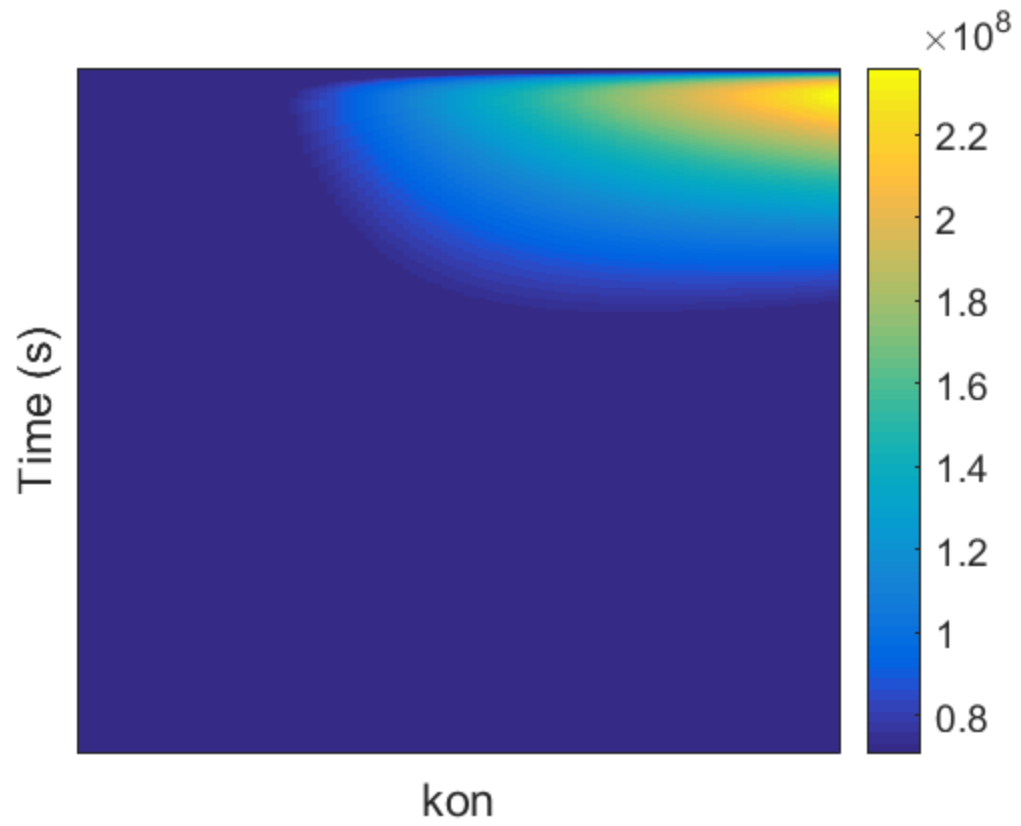
```
dx_dt(8)= - koni*x(1)*x(8) + ii*x(5);
```

```
% light
```

```
dx_dt(9)=700000*kcat*x(5)*dark-x(9);
```

```
dx_dt=dx_dt';
```

```
return
```



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