# The replicator dynamics equation

function dydt=CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2)

dydt=zeros(3,1);

dydt(1)=-y(1)\*(y(1)-1)\*(H1-I1+K1-S1+y(3)\*y(2)\*T1);

dydt(2)=-y(2)\*(y(2)-1)\*(H2-I2+K2-S2+y(1)\*y(3)\*T2);

dydt(3)=-y(3)\*(y(3)-1)\*(L-C+M+y(1)\*y(2)\*T3);

end

# %% The Impact of Changes on the Evolution Path

clc,clear;

figure('color',[1 1 1]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=40,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=50,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=60,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on;

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'zTick',[0:0.2:1])

axis([0 1 0 1 0 1])

xlabel('$x$','interpreter','latex');ylabel('$y$','interpreter','latex');zlabel('$z$','interpreter','latex','Rotation',360,'position',[-0.1 1 1.1]);

grid on

hold on

set(0,'defaultfigurecolor','w')

legend({'{\it\fontname{Bodoni MT}I\_{1}}=30','{\it\fontname{Bodoni MT}I\_{1}}=40','{\it\fontname{Bodoni MT}I\_{1}}=50','{\it\fontname{Bodoni MT}I\_{1}}=60'},'location','northeast');

axes('position',[0.13 0.32 0.2 0.2]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=40,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=50,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=60,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'ZTick',[0:0.2:1])

axis([0 1 0 1 0 1])

set(gca,'XTickLabel','','YTickLabel','','ZTickLabel','')

grid on

hold on

set(0,'defaultfigurecolor','w')

view([0 90]);

xlabel('x','position',[0.9 0.1 0])

ylabel('y','position',[0.1 1 0.8],'Rotation',360)

# %% The Impact of Changes on the Evolution Path

clc,clear;

figure('color',[1 1 1]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=60,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=70,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=80,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on;

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'zTick',[0:0.2:1])

axis([0 1 0 1 0 1])

xlabel('$x$','interpreter','latex');ylabel('$y$','interpreter','latex');zlabel('$z$','interpreter','latex','Rotation',360,'position',[-0.1 1 1.1]);

grid on

hold on

set(0,'defaultfigurecolor','w')

legend({'{\it\fontname{Bodoni MT}I\_{2}}=50','{\it\fontname{Bodoni MT}I\_{2}}=60','{\it\fontname{Bodoni MT}I\_{2}}=70','{\it\fontname{Bodoni MT}I\_{2}}=80'},'location','northeast');

axes('position',[0.13 0.32 0.2 0.2]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=60,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=70,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=80,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'ZTick',[0:0.2:1])

axis([0 1 0 1 0 1])

set(gca,'XTickLabel','','YTickLabel','','ZTickLabel','')

grid on

hold on

set(0,'defaultfigurecolor','w')

view([0 90]);

xlabel('x','position',[0.8 -0.1 0.2])

ylabel('y','position',[0.1 1 0.8],'Rotation',360)

# %% The Impact of Changes on the Evolution Path

clc,clear;

figure('color',[1 1 1]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=40,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=50,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=60,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on;

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'zTick',[0:0.2:1])

axis([0 1 0 1 0 1])

xlabel('$x$','interpreter','latex');ylabel('$y$','interpreter','latex');zlabel('$z$','interpreter','latex','Rotation',360,'position',[-0.1 1 1.1]);

grid on

hold on

set(0,'defaultfigurecolor','w')

legend({'{\it\fontname{Bodoni MT}C}=30','{\it\fontname{Bodoni MT}C}=40','{\it\fontname{Bodoni MT}C}=50','{\it\fontname{Bodoni MT}C}=60'},'location','northeast');

axes('position',[0.13 0.32 0.2 0.2]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=40,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=50,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=60,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'ZTick',[0:0.2:1])

axis([0 1 0 1 0 1])

set(gca,'XTickLabel','','YTickLabel','','ZTickLabel','')

grid on

hold on

set(0,'defaultfigurecolor','w')

view([0 90]);

xlabel('x','position',[0.8 -0.1 0.2])

ylabel('y','position',[0.1 1 0.8],'Rotation',360)

# %% The Impact of Changes on the Evolution Path

clc,clear;

figure('color',[1 1 1]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=10,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=20,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=40,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on;

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'zTick',[0:0.2:1])

axis([0 1 0 1 0 1])

xlabel('$x$','interpreter','latex');ylabel('$y$','interpreter','latex');zlabel('$z$','interpreter','latex','Rotation',360,'position',[-0.1 1 1.1]);

grid on

hold on

set(0,'defaultfigurecolor','w')

legend({'{\it\fontname{Bodoni MT}K\_{1}}=10','{\it\fontname{Bodoni MT}K\_{1}}=20','{\it\fontname{Bodoni MT}K\_{1}}=30','{\it\fontname{Bodoni MT}K\_{1}}=40'},'location','northeast');

axes('position',[0.13 0.32 0.2 0.2]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=10,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=20,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=40,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'ZTick',[0:0.2:1])

axis([0 1 0 1 0 1])

set(gca,'XTickLabel','','YTickLabel','','ZTickLabel','')

grid on

hold on

set(0,'defaultfigurecolor','w')

view([0 90]);

xlabel('x','position',[0.8 -0.1 0.2])

ylabel('y','position',[0.1 1 0.8],'Rotation',360)

# %% The Impact of Changes on the Evolution Path

clc,clear;

figure('color',[1 1 1]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=35,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=55,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=65,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on;

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'zTick',[0:0.2:1])

axis([0 1 0 1 0 1])

xlabel('$x$','interpreter','latex');ylabel('$y$','interpreter','latex');zlabel('$z$','interpreter','latex','Rotation',360,'position',[-0.1 1 1.1]);

grid on

hold on

set(0,'defaultfigurecolor','w')

legend({'{\it\fontname{Bodoni MT}K\_{2}}=35','{\it\fontname{Bodoni MT}K\_{2}}=45','{\it\fontname{Bodoni MT}K\_{2}}=55','{\it\fontname{Bodoni MT}K\_{2}}=65'},'location','northeast');

axes('position',[0.13 0.32 0.2 0.2]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=35,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=55,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=65,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'ZTick',[0:0.2:1])

axis([0 1 0 1 0 1])

set(gca,'XTickLabel','','YTickLabel','','ZTickLabel','')

grid on

hold on

set(0,'defaultfigurecolor','w')

view([0 90]);

xlabel('x','position',[0.8 -0.1 0.2])

ylabel('y','position',[0.1 1 0.8],'Rotation',360)

# %% The Impact of Changes on the Evolution Path

clc,clear;

figure('color',[1 1 1]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=5,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=15,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=20,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on;

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'zTick',[0:0.2:1])

axis([0 1 0 1 0 1])

xlabel('$x$','interpreter','latex');ylabel('$y$','interpreter','latex');zlabel('$z$','interpreter','latex','Rotation',360,'position',[-0.1 1 1.1]);

grid on

hold on

set(0,'defaultfigurecolor','w')

legend({'{\it\fontname{Bodoni MT}T\_{1}}=5','{\it\fontname{Bodoni MT}T\_{1}}=10','{\it\fontname{Bodoni MT}T\_{1}}=15','{\it\fontname{Bodoni MT}T\_{1}}=20'},'location','northeast');

axes('position',[0.13 0.32 0.2 0.2]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=5,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=15,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=20,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'ZTick',[0:0.2:1])

axis([0 1 0 1 0 1])

set(gca,'XTickLabel','','YTickLabel','','ZTickLabel','')

grid on

hold on

set(0,'defaultfigurecolor','w')

view([0 90]);

xlabel('x','position',[0.8 -0.1 0.2])

ylabel('y','position',[0.1 1 0.8],'Rotation',360)

# %% The Impact of Changes on the Evolution Path

clc,clear;

figure('color',[1 1 1]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=10,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=30,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=40,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on;

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'zTick',[0:0.2:1])

axis([0 1 0 1 0 1])

xlabel('$x$','interpreter','latex');ylabel('$y$','interpreter','latex');zlabel('$z$','interpreter','latex','Rotation',360,'position',[-0.1 1 1.1]);

grid on

hold on

set(0,'defaultfigurecolor','w')

legend({'{\it\fontname{Bodoni MT}T\_{2}}=10','{\it\fontname{Bodoni MT}T\_{2}}=20','{\it\fontname{Bodoni MT}T\_{2}}=30','{\it\fontname{Bodoni MT}T\_{2}}=40'},'location','northeast');

axes('position',[0.13 0.32 0.2 0.2]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=10,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=30,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=40,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'ZTick',[0:0.2:1])

axis([0 1 0 1 0 1])

set(gca,'XTickLabel','','YTickLabel','','ZTickLabel','')

grid on

hold on

set(0,'defaultfigurecolor','w')

view([0 90]);

xlabel('x','position',[0.8 -0.1 0.2])

ylabel('y','position',[0.1 1 0.8],'Rotation',360)

# %% The Impact of Changes on the Evolution Path

clc,clear;

figure('color',[1 1 1]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=5,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=15,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=20,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on;

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'zTick',[0:0.2:1])

axis([0 1 0 1 0 1])

xlabel('$x$','interpreter','latex');ylabel('$y$','interpreter','latex');zlabel('$z$','interpreter','latex','Rotation',360,'position',[-0.1 1 1.1]);

grid on

hold on

set(0,'defaultfigurecolor','w')

legend({'{\it\fontname{Bodoni MT}T\_{3}}=5','{\it\fontname{Bodoni MT}T\_{3}}=10','{\it\fontname{Bodoni MT}T\_{3}}=15','{\it\fontname{Bodoni MT}T\_{3}}=20'},'location','northeast');

axes('position',[0.13 0.32 0.2 0.2]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=5,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=15,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=20,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'ZTick',[0:0.2:1])

axis([0 1 0 1 0 1])

set(gca,'XTickLabel','','YTickLabel','','ZTickLabel','')

grid on

hold on

set(0,'defaultfigurecolor','w')

view([0 0]);

xlabel('x','position',[0.8 -0.1 0.2])

zlabel('z','position',[0.1 1 0.8],'Rotation',360)

# %% The Impact of Changes on the Evolution Path

clc,clear;

figure('color',[1 1 1]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=5,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=10,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=15,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on;

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'zTick',[0:0.2:1])

axis([0 1 0 1 0 1])

xlabel('$x$','interpreter','latex');ylabel('$y$','interpreter','latex');zlabel('$z$','interpreter','latex','Rotation',360,'position',[-0.1 1 1.1]);

grid on

hold on

set(0,'defaultfigurecolor','w')

legend({'{\it\fontname{Bodoni MT}H\_{1}}=5','{\it\fontname{Bodoni MT}H\_{1}}=10','{\it\fontname{Bodoni MT}H\_{1}}=15','{\it\fontname{Bodoni MT}H\_{1}}=20'},'location','northeast');

axes('position',[0.13 0.32 0.2 0.2]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=5,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=10,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=15,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'ZTick',[0:0.2:1])

axis([0 1 0 1 0 1])

set(gca,'XTickLabel','','YTickLabel','','ZTickLabel','')

grid on

hold on

set(0,'defaultfigurecolor','w')

view([0 90]);

xlabel('x','position',[0.8 -0.1 0.2])

ylabel('y','position',[0.1 1 0.8],'Rotation',360)

# %% The Impact of Changes on the Evolution Path

clc,clear;

figure('color',[1 1 1]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=5;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=10;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=15;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on;

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'zTick',[0:0.2:1])

axis([0 1 0 1 0 1])

xlabel('$x$','interpreter','latex');ylabel('$y$','interpreter','latex');zlabel('$z$','interpreter','latex','Rotation',360,'position',[-0.1 1 1.1]);

grid on

hold on

set(0,'defaultfigurecolor','w')

legend({'{\it\fontname{Bodoni MT}H\_{2}}=5','{\it\fontname{Bodoni MT}H\_{2}}=10','{\it\fontname{Bodoni MT}H\_{2}}=15','{\it\fontname{Bodoni MT}H\_{2}}=20'},'location','northeast');

axes('position',[0.13 0.32 0.2 0.2]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=5;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=10;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=15;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'ZTick',[0:0.2:1])

axis([0 1 0 1 0 1])

set(gca,'XTickLabel','','YTickLabel','','ZTickLabel','')

grid on

hold on

set(0,'defaultfigurecolor','w')

view([0 90]);

xlabel('x','position',[0.8 -0.1 0.2])

ylabel('y','position',[0.1 1 0.8],'Rotation',360)

# %% The Impact of Changes on the Evolution Path

clc,clear;

figure('color',[1 1 1]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=20,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=30,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=40,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on;

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'zTick',[0:0.2:1])

axis([0 1 0 1 0 1])

xlabel('$x$','interpreter','latex');ylabel('$y$','interpreter','latex');zlabel('$z$','interpreter','latex','Rotation',360,'position',[-0.1 1 1.1]);

grid on

hold on

set(0,'defaultfigurecolor','w')

legend({'{\it\fontname{Bodoni MT}S\_{1}}=15','{\it\fontname{Bodoni MT}S\_{1}}=20','{\it\fontname{Bodoni MT}S\_{1}}=30','{\it\fontname{Bodoni MT}S\_{1}}=40'},'location','northeast');

axes('position',[0.13 0.32 0.2 0.2]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=20,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=30,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=40,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'ZTick',[0:0.2:1])

axis([0 1 0 1 0 1])

set(gca,'XTickLabel','','YTickLabel','','ZTickLabel','')

grid on

hold on

set(0,'defaultfigurecolor','w')

view([0 90]);

xlabel('x','position',[0.8 0.1 0.2])

ylabel('y','position',[0.1 1 0.8],'Rotation',360)

# %% The Impact of Changes on the Evolution Path

clc,clear;

figure('color',[1 1 1]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=30,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=35,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=40,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on;

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'zTick',[0:0.2:1])

axis([0 1 0 1 0 1])

xlabel('$x$','interpreter','latex');ylabel('$y$','interpreter','latex');zlabel('$z$','interpreter','latex','Rotation',360,'position',[-0.1 1 1.1]);

grid on

hold on

set(0,'defaultfigurecolor','w')

legend({'{\it\fontname{Bodoni MT}S\_{2}}=25','{\it\fontname{Bodoni MT}S\_{2}}=30','{\it\fontname{Bodoni MT}S\_{2}}=35','{\it\fontname{Bodoni MT}S\_{2}}=40'},'location','northeast');

axes('position',[0.13 0.32 0.2 0.2]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=30,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=35,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=40,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'ZTick',[0:0.2:1])

axis([0 1 0 1 0 1])

set(gca,'XTickLabel','','YTickLabel','','ZTickLabel','')

grid on

hold on

set(0,'defaultfigurecolor','w')

view([0 90]);

xlabel('x','position',[0.8 -0.1 0.2])

ylabel('y','position',[0.1 1 0.8],'Rotation',360)

# %% The Impact of Changes on the Evolution Path

clc,clear;

figure('color',[1 1 1]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=5,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=10,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=15,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on;

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'zTick',[0:0.2:1])

axis([0 1 0 1 0 1])

xlabel('$x$','interpreter','latex');ylabel('$y$','interpreter','latex');zlabel('$z$','interpreter','latex','Rotation',360,'position',[-0.1 1 1.1]);

grid on

hold on

set(0,'defaultfigurecolor','w')

legend({'{\it\fontname{Bodoni MT}L}=5','{\it\fontname{Bodoni MT}L}=10','{\it\fontname{Bodoni MT}L}=15','{\it\fontname{Bodoni MT}L}=20'},'location','northeast');

axes('position',[0.13 0.32 0.2 0.2]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=5,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=10,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=15,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'ZTick',[0:0.2:1])

axis([0 1 0 1 0 1])

set(gca,'XTickLabel','','YTickLabel','','ZTickLabel','')

grid on

hold on

set(0,'defaultfigurecolor','w')

view([0 90]);

xlabel('x','position',[0.8 -0.1 0.2])

ylabel('y','position',[0.1 1 0.8],'Rotation',360)

# %% The Impact of Changes on the Evolution Path

clc,clear;

figure('color',[1 1 1]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=5,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=10,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on;

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=20,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

stem3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on;

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'zTick',[0:0.2:1])

axis([0 1 0 1 0 1])

xlabel('$x$','interpreter','latex');ylabel('$y$','interpreter','latex');zlabel('$z$','interpreter','latex','Rotation',360,'position',[-0.1 1 1.1]);

grid on

hold on

set(0,'defaultfigurecolor','w')

legend({'{\it\fontname{Bodoni MT}M}=5','{\it\fontname{Bodoni MT}M}=10','{\it\fontname{Bodoni MT}M}=15','{\it\fontname{Bodoni MT}M}=20'},'location','northeast');

axes('position',[0.13 0.32 0.2 0.2]);

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=5,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'r+','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=10,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'go','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=15,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'b\*','linewidth',1);

hold on

Q=50,p=5,w=3,r=0.1,I1=30,I2=50,S1=15,S2=25,K1=30,K2=45,C=30,T1=10,T2=20,T3=10,L=20,M=20,H1=20,H2=20;

[t,y]=ode45(@(t,y) CGB(t,y,Q,p,w,r,I1,I2,S1,S2,K1,K2,C,L,T1,T2,T3,M,H1,H2),[0 50],[0.3 0.3 0.3]);

plot3(y(:,1),y(:,2),y(:,3),'yp','linewidth',1);

hold on

set(gca,'XTick',[0:0.2:1],'YTick',[0:0.2:1],'ZTick',[0:0.2:1])

axis([0 1 0 1 0 1])

set(gca,'XTickLabel','','YTickLabel','','ZTickLabel','')

grid on

hold on

set(0,'defaultfigurecolor','w')

view([0 90]);

xlabel('x','position',[0.8 -0.1 0.2])

ylabel('y','position',[0.1 1 0.8],'Rotation',360)