Solution du TDN°3

```
% Effet de variation d' Eclairement sur un module PV
clear

Rs=0.50;Ish=3.06;Voc=21.6;Iop=2.78;Vop=18;n=0.004;m=0.0006;Tr=25;Er=1000;
V=24;I=0;dI=0.005; T=Tr; k=1; j=1; E=200;

B=(Vop+Iop*Rs-Voc)/log(1-Iop/Ish);
A=(Ish-Iop)*exp(-(Vop+Iop*Rs)/B);

while (I<=Ish)
       g=-A*(exp((V+Rs*I)/B)/B);
       f=Ish-I-A*(exp((V+Rs*I)/B)-1);
       a=f/g;
       V1=V-a;
       err=abs(V1-V);

               if err<=1e-7
                  II(j)=I;
                  VV(j)=V;
                  I=I+dI;
                  j=j+1;
               end
       V=V1;
end

% effet de l'éclairement commence
  while (E<=1000)&(k<=5)

                 for j=1:1:length(II);
                     m=0.0006*II(j);
                     n=0.004*VV(j);
                     DI=((E/Er)-1)*Ish;
                     DV=-Rs*DI;
                     I2(j)=II(j)+DI;
                     V2(j)=VV(j)+DV;
                     M(j,k)=I2(j);
                     N(j,k)=V2(j);
                  end
       E=E+200;
       k=k+1;
 end;

figure(1),plot(N,M),axis([0  25  0  3.5]),grid
 figure(2),plot(N,N.*M),axis([0  25 0  55]),grid
```

```
% Effet  de la variation de la température pour un module PV

clear
Rs=0.50;Ish=3.06;Voc=21.6;Iop=2.78;Vop=18;n=0.004;m=0.0006;Tr=25;;
V=24;I=0;dI=0.005; T=Tr; k=1; j=1; T=45;


B=(Vop+Iop*Rs-Voc)/log(1-Iop/Ish);
A=(Ish-Iop)*exp(-(Vop+Iop*Rs)/B);

while (I<=Ish)
       g=-A*(exp((V+Rs*I)/B)/B);
       f=Ish-I-A*(exp((V+Rs*I)/B)-1);
       a=f/g;
       V1=V-a;
       err=abs(V1-V);
                    if err<=1e-7
                       II(j)=I;
                       VV(j)=V1;
                       I=I+dI;
                       j=j+1;
                    end
       V=V1;
end;

% effet de la variation de la température commence
      while (T<=105)& (k<=5)
             DT=T-Tr;
                      for j=1:1:length(II);
                          m1=0.0006*II(j);
                          n1=0.004*VV(j);
                          DI=m1*DT;
                          DV=-n1*DT-Rs*DI;
                          I2(j)=II(j)+DI;
                          V2(j)=VV(j)+DV;
                          M(j,k)=I2(j);
                          N(j,k)=V2(j);
                      end
             T=T+20;
             k=k+1;
      end;

figure(1),plot(N,M),axis([0 24 0 3.5]),grid
figure(2),plot(N, M.*N),axis([0 24 0 50]),grid
```

```
% Effet de la variation l'éclairement et de température pour un module PV
clear

Rs=0.50;Ish=3.06;Voc=21.6;Iop=2.78;Vop=18;n=0.004;m=0.0006;Tr=25;Er=1000;
V=24;I=0;dI=0.005; T=Tr; k=1; j=1; E=200;

B=(Vop+Iop*Rs-Voc)/log(1-Iop/Ish);
A=(Ish-Iop)*exp(-(Vop+Iop*Rs)/B);

while (I<=Ish)
           g=-A*(exp((V+Rs*I)/B)/B);
           f=Ish-I-A*(exp((V+Rs*I)/B)-1);
           a=f/g;
           V1=V-a;
           err=abs(V1-V);
                          if err<=1e-7
                             II(j)=I;
                             VV(j)=V;
                             I=I+dI;
                             j=j+1;
                          end
           V=V1;
end;

%effet de E et T commence
    while (E<=1000)&(T<=105)& (k<=5)
          DT=T-Tr;
                    for j=1:1:length(II);
                        m1=0.0006*II(j);
                        n1=0.004*VV(j);
                        DI=m1*(E/Er)*DT+((E/Er)-1)*Ish;
                        DV=-n1*DT-Rs*DI;
                        I2(j)=II(j)+DI;
                        V2(j)=VV(j)+DV;
                        M(j,k)=I2(j);
                        N(j,k)=V2(j);
                     end
            T=T+15;
            E=E+200;
            k=k+1;
end;

figure(1),plot(N,M),axis([0 24 0 3]),grid
figure(2),plot(N, M.*N),axis([0 24 0 50]),grid
```