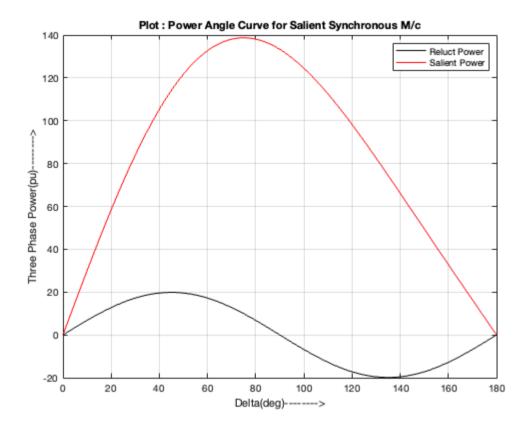
```
% Supreeth Rao 1MS19EE057 19/10/2022
% Determination of power angle characteristics of salient and non salient pole motor
clear;
P = 48;
pf=0.8;
Vt=34.64;
Xd=13.5;
Xq=9.33;
Vtph=Vt*1000/sqrt(3); % Per phase Voltage
pf_a=acos(pf);
Q=P*tan(pf a);
I=(P-j*Q)*1000000/(3*Vtph); % Current in Amps
delta=0:1:180;
delta rad=delta*(pi/180);
if Xd~=Xq
    %Salient Pole Synchronous Motor
    Eq=Vtph+(j*I*Xq);
    Id mag=abs(I)*sin(angle(Eq)-angle(I));
    Ef_mag=abs(Eq)+((Xd-Xq)*Id_mag);
    Exitation emf=Ef mag
    Reg=(Ef mag-abs(Vtph))*100/abs(Vtph)
    PP=Ef mag*Vtph*sin(delta rad)/Xd;
    Reluct Power=Vtph^2*(Xd-Xq)*sin(2*delta rad)/(2*Xd*Xq);
    Net Reluct Power=3*Reluct Power/1000000;
    Power sal=PP+Reluct Power;
    Net Power sal=3*Power sal/1000000;
    plot(delta,Net_Reluct_Power,'K');
    hold on
    plot(delta,Net Power sal,'r');
    xlabel('Delta(deg)---->');
    ylabel('Three Phase Power(pu)----->');
    title('Plot : Power Angle Curve for Salient Synchronous M/c');
    legend('Reluct Power', 'Salient Power');
end
if Xd==Xq
   %Non-Salient Pole Synchronous Motor
   Ef=Vtph+(j*I*Xd);
   Exitation emf=abs(Ef)
    Reg=(abs(Ef)-abs(Vtph))*100/abs(Vtph)
    Power_non=abs(Ef)*Vtph*sin(delta_rad)/Xd;
   Net_Power=3*Power_non/1000000;
    plot(delta,Net Power);
    xlabel('Delta(deg)---->');
    ylabel('Three Phase Power(MW)---->');
    title('Plot : Power Angle Curve for Non-Salient Synchronous M/c');
    legend('Non-Salient Power');
    end
grid;
```

```
Exitation_emf = 3.0000e+04
```



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