clc

clear all

close all

% Aug 10 date

n = 221;

T = 6:0.20:18;

%phi of rolla = latitude of rolla - 37.9514

phi = 37.9514;

%d - delta - declination or deviation

d = 23.45\*(sin((360\*(pi/180)\*(n-80))/(365)));

%w - omega - hour angle, T - time(24 hours)

w = ((12-T).\*(360))/(24);

%sina - sin(alpha) - angle from perpendicular distance

sina = (sin(d\*(pi/180))\*sin((pi/180)\*phi))+(cos((pi/180)\*d)\*cos((pi/180)\*phi)\*cos((pi/180)\*w));

% %AM - Airmass = cosec(alpha) = 1/sin(alpha) = 1/sina

AM = 1./sina;

%I

I = 1367.\*((0.7).^((AM).^0.678));

plot(T,I,'-')

grid on

axis([6 18 0 1100])

area = trapz(T,I)

plot



Area under plot = 975 watt/m2