```
%solar power generating
n = 0.283; %solar cell efficiency
i = 0.9; %inherent degeneration
c = 1367; %solar constant
filename = 'C:\Users\lunat_000\OneDrive - University of Florida 2\Fall
2016\EAS4700\Power Stuff\Tatiana Angles\01 JAN.xlsx';
data = xlsread(filename,'A2: D1201'); %time is sec
seconds= data(:,1) ; angles = data(:,3);
istherelight = data(:,4);

s= n*c*i*sind(angles);
x=6; %number sides exposed
A = 0.028; %area per side
powerpersec = A*x*s;
powerpersec(istherelight==0) = 0;
power = mean(reshape(powerpersec,50,24));
hours = 1:720;
power(power<0) = 0; %if angle is neg. means panels facing away thus p=0
monthpower = repmat(power', 30,1); %power for 30 days

% plot(theta,power);
plot(hours, monthpower);
xlabel('Time (h)'); ylabel('Power (Wh)');
title('Power Generated');
grid on

%power needed
WneedphMax = 27.3655; %watts needed per hour with thruster on
WneedphAv = 8.9205; % average watts needed per hour
Wbatt = 80; %try 80 - wh

for i = 1:69 %thruster runs 69 continuous hours
    Wpower(i) = Wbatt - WneedphMax + monthpower(i);
    Wbatt = Wpower(i);
    if Wbatt < 0
        Wbatt = 0;
    end
end
for i=70:121 %51 hours break
    Wpower(i) = Wbatt - WneedphAv + monthpower(i);
    Wbatt = Wpower(i);
    if Wbatt < 0
        Wbatt = 0;
        elseif Wbatt> 80
        Wbatt = 80;
        Wpower(i) = 80;
    end
end
for i=71:162 %51 hours break
    Wpower(i) = Wbatt - WneedphMax + monthpower(i);
    Wbatt = Wpower(i);
    if Wbatt < 0
        Wbatt = 0;
    elseif Wbatt> 80
        Wbatt = 80;
        Wpower(i) = 80;
```

```
    end
end
for i=163:720 %51 hours break
    Wpower(i) = Wbatt - WneedphAv + monthpower(i);
    Wbatt = Wpower(i);
    if Wbatt < 0
        Wbatt = 0;
    elseif Wbatt> 80
        Wbatt = 80;
        Wpower(i) = 80;
    end
end

figure;
plot(hours, Wpower);
xlabel('Time (h)');
ylabel('Power(Wh)');
% ylim([min(Wpower) max(Wpower)+2]);
title('Power of system');
grid on
```