**OUTPUT**

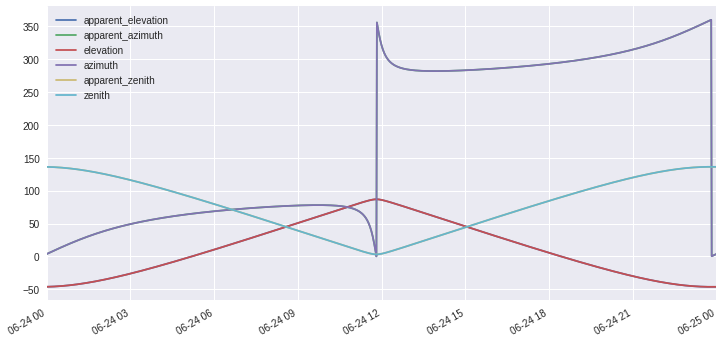


Fig.1: Based on Data of Bhubaneswar, Frequency 1 min

x-axis: time and date

y-axis: angle

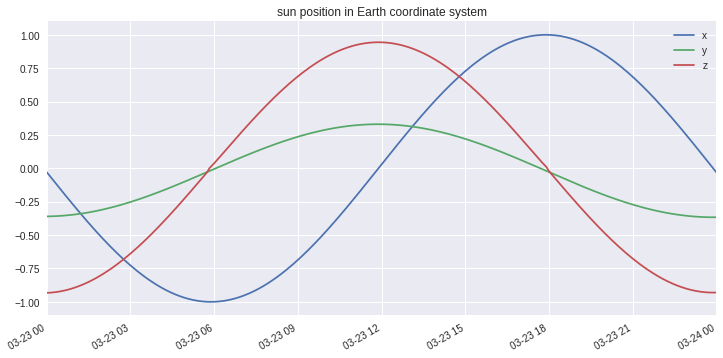


Fig.2: Based on data of Bhubaneswar, Frequency 5 min

x-axis: time and date

az = apparent\_azimuth - 180

apparent\_elevation = 90 - apparent\_zenith

x = cosd(apparent\_elevation) \* sind(az)

y = cosd(apparent\_elevation) \* cosd(az)

z = sind(apparent\_elevation)

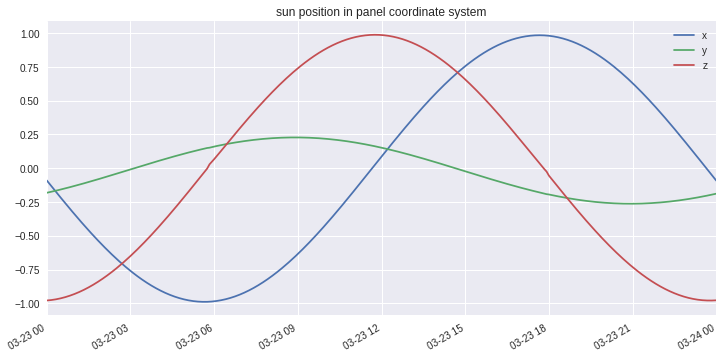


Fig 3: Based on Data of Bhubaneswar, Frequency 5 Min

x-axis: time and date

x1 = x\*cosd(axis\_azimuth\_south) - y\*sind(axis\_azimuth\_south);

y1 = (x\*cosd(axis\_tilt)\*sind(axis\_azimuth\_south) +

y\*cosd(axis\_tilt)\*cosd(axis\_azimuth\_south) -

z\*sind(axis\_tilt))

z1 = (x\*sind(axis\_tilt)\*sind(axis\_azimuth\_south) +

y\*sind(axis\_tilt)\*cosd(axis\_azimuth\_south) +

z\*cosd(axis\_tilt))

where x,y,z are coordinate in Earth coordinate system and x1,y1,z1 are x,y,z, respectively shown in figure

**For Single-Axis Tracking:**

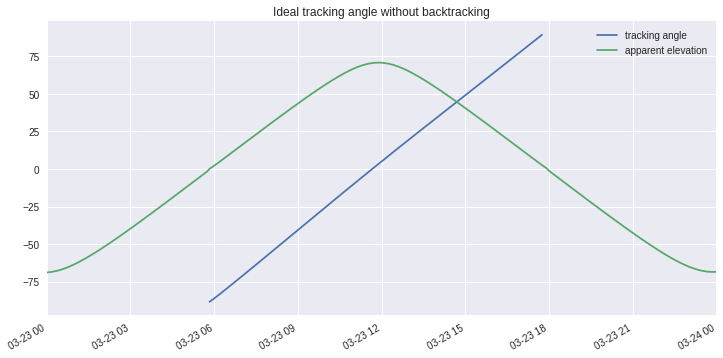


Fig.4: Ideal tracking angle without backtracking for single axis tracking system based on Bhubaneswar database

x-axis:time and date

y-axis: angle

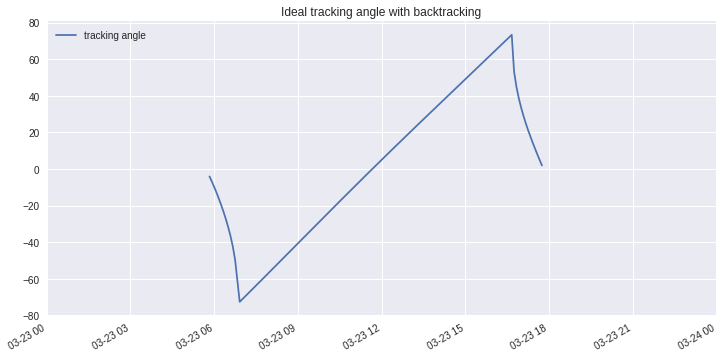


Fig.5: Ideal tracking angle with backtracking for single axis tracker based on Bhubaneswar database

x-axis:time and date

y-axis: angle

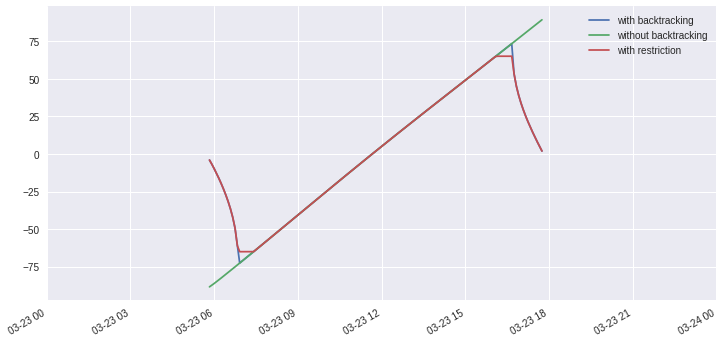


Fig.6: Ideal tracking angle with backtracking and restriction on maximum angle for single axis tracker based on Bhubaneswar database,

x-axis:time and date

y-axis: angle

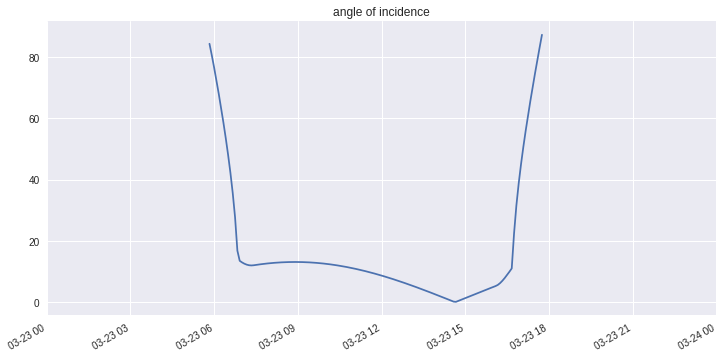


Fig.7: angel of incidence based on Bhubaneswar database,

x-axis:time and date

y-axis: angle

**Based on Sandia National Laboratory Database:**

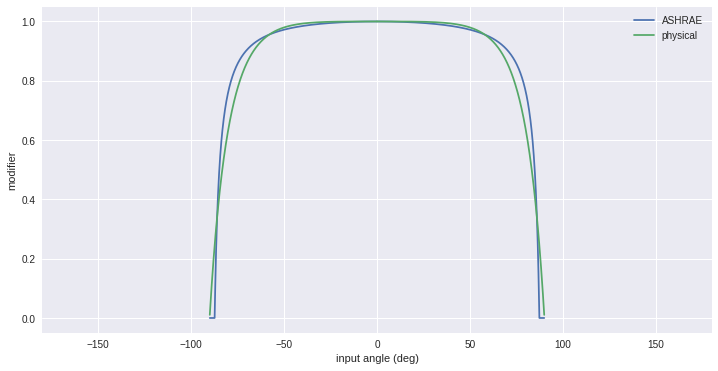


Fig.8: Comparison of ASHRAE and physical modifier

x-axis: input angle, y-axis: modifier value

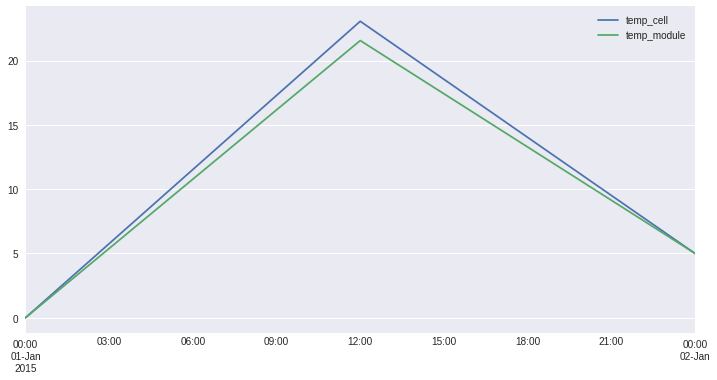


Fig.9: Comparison of cell and module temperature

x-axis: date and time

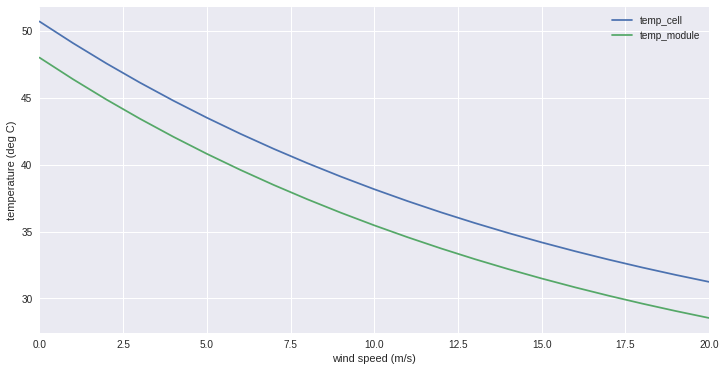
y-axis: temperature in Celsius 

Fig.10: temperature versus wind speed comparison between cell and module

x-axis: wind speed (m/s)

y-axis: temperature (deg C)

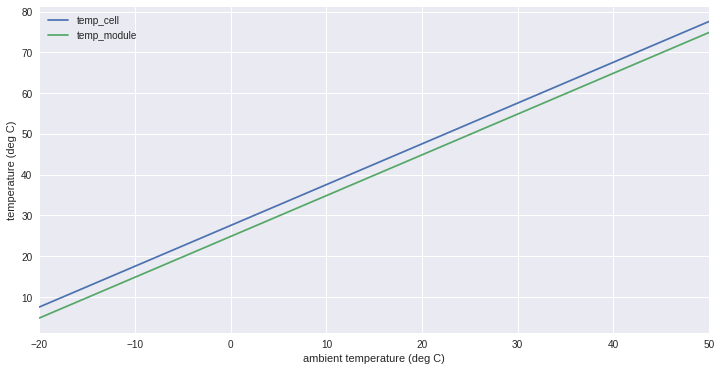


Fig.11: temperature versus ambient temperature comparison between cell and module

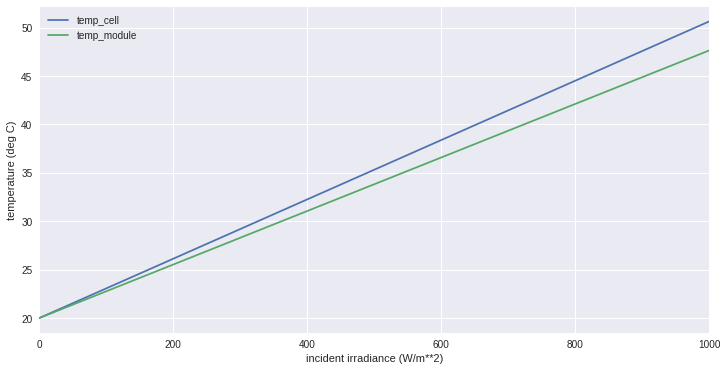
x-axis & y-axis: temperature (deg C) 

Fig.12: temperature versus incident irradiance comparison of cell and module

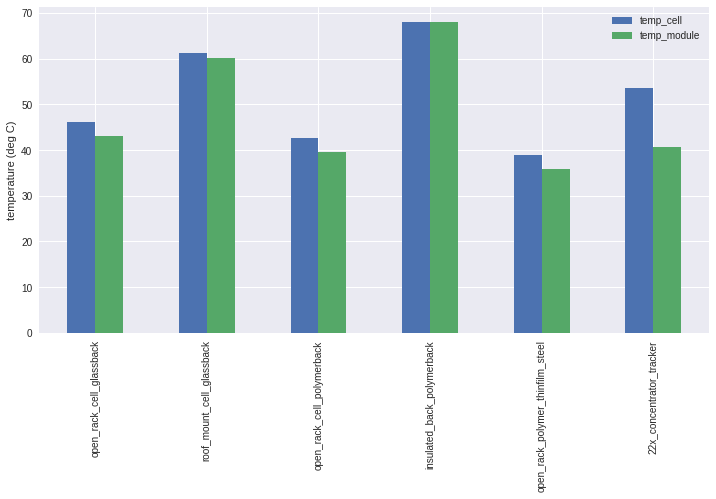


Fig.13: comparison between cell and module temperature for various models

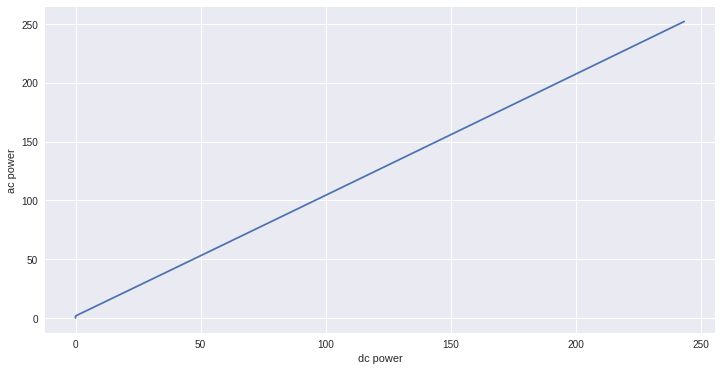


Fig.14: ac power output versus dc power output

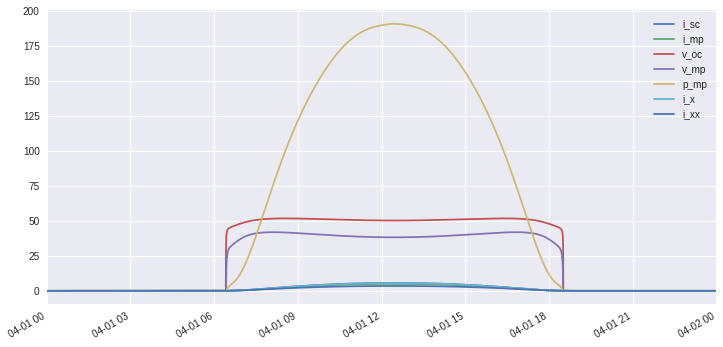


Fig.15: Comparison of various parameters

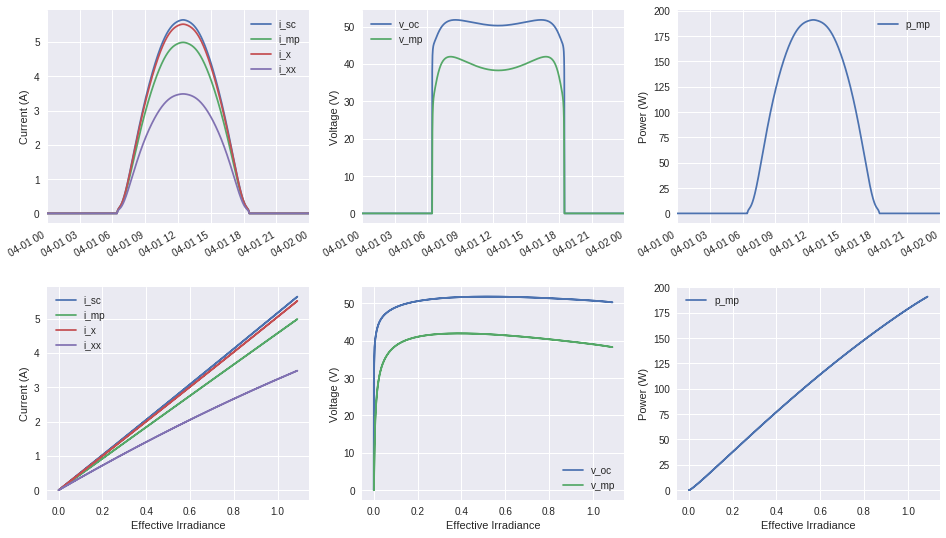


Fig.16: Comparison of various parameters

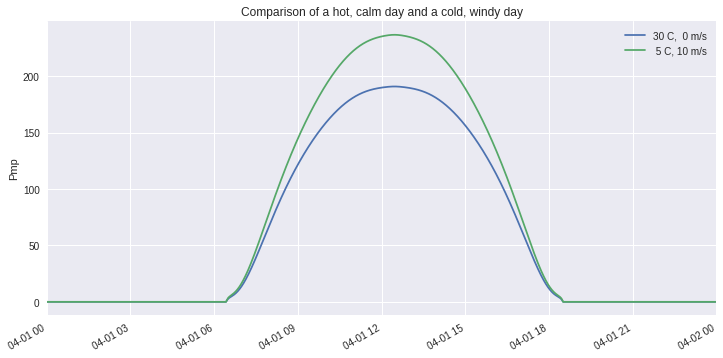


Fig.17: Comparison between two instances

Pmp= Power at maxima point

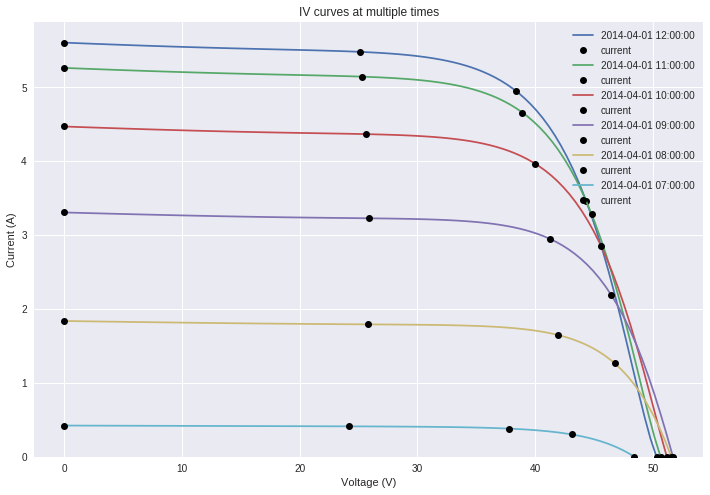


Fig.18: VI curve for solar cell