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Modeling Project Part 3
Basic Solar Array Power Output Calculator

Inputs:

- Location latitude: 32
- Location longitude: -30
- PV array tilt: 15
- Day of year: 112
- Civil time of day, in hours: 16
- Time zone in reference to UTC: -2
- Clearness index: 0.55
- Albedo: 0.25
- Ambient temperature (°C): 29
- Module NOCT (°C): 45.7
- Module power rating (STC): 255
- Module open-circuit voltage (V, STC): 37.8
- Module short-circuit current (A, STC): 8.89
- Module power coefficient (%/°C): -0.450
- Module voltage coefficient (%/°C): -0.350
- Module current coefficient (%/°C): 0.056
- Number of PV modules per string: 10
- Number of strings: 6

Outputs:

- Extraterrestrial irradiance on plane normal to sun, $G_{0n}$: 1351.23 W/m$^2$
- Declination angle, δ (degrees): 11.93 degrees
- Hour angle, ω (degrees): 75 degrees
- Zenith angle, $\theta_z$ (degrees): 71.08 degrees
- Angle of incidence, θ (degrees): 73.29 degrees
- Cosine of the angle of incidence: 0.30
- Irradiance on the PV array ignoring the effects of the atmosphere, $G_{0T}$: 408.87 W/m$^2$
- Global Horizontal Irradiance, $G_{GHI}$ : 241.00 W/m$^2$
- Beam component of GHI, $G_b$: 149.78 W/m$^2$
- Diffuse component of GHI, $G_d$: 91.22 W/m$^2$
- Coefficient $R_b$: 0.93
- Beam irradiance on tilted surface, $G_{bT}$: 139.76 W/m$^2$
- Diffuse irradiance on tilted surface, $G_{dT}$: 89.66 W/m$^2$
- Ground reflected irradiance on the tilted surface, $G_{gnd,T}$: 1.03 W/m$^2$
- Total irradiance on the tilted surface, $G_T$: 230.45 W/m$^2$
- Module temperature (°C): 36.40 °C
- Array open-circuit voltage (V): 362.91 V
- Array short-circuit current (A): 12.37 A
- Array maximum power (W): 3345.00 W