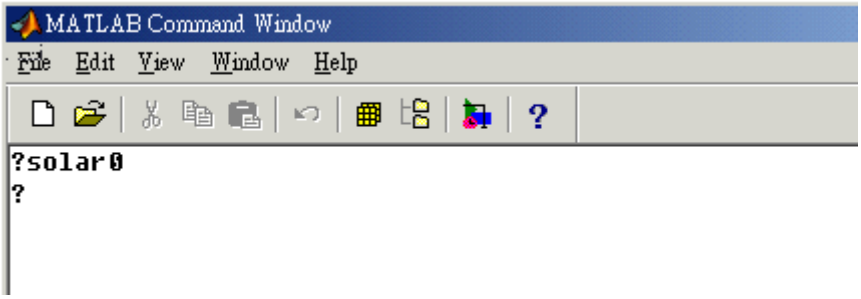
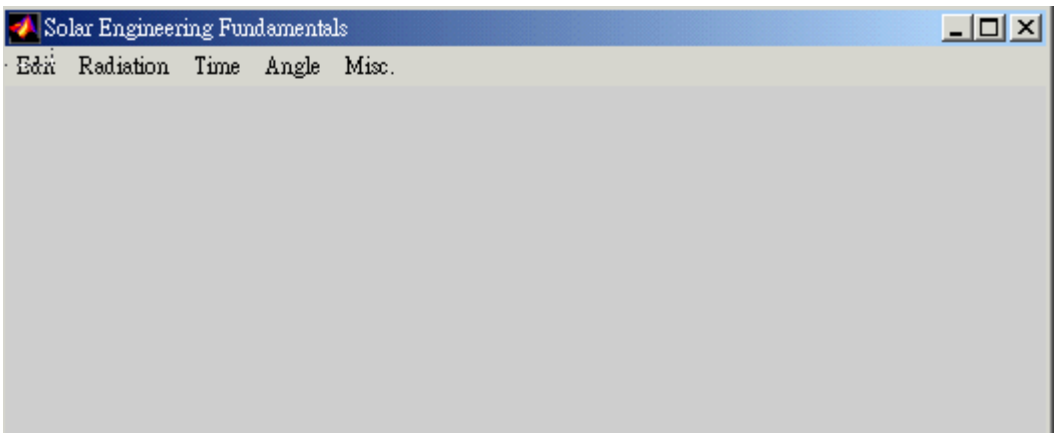
MATLAB program for Solar Engineering Fundamentals

1. Program execution

Enter ‘solar0’ in the command window to execute the program.



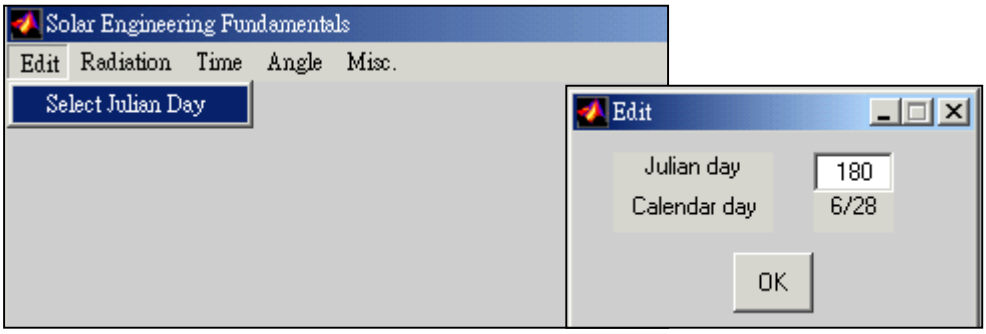
A window with 5 options in the main menu will pop up from the monitor as shown below. The 5 options are: Edit, Radiation, Time, Angle and Misc..



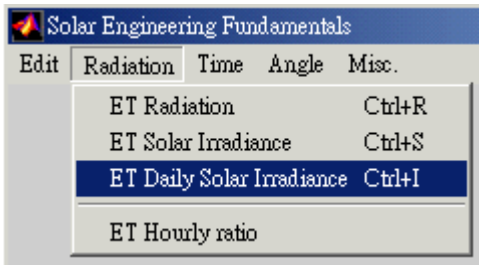
2. Main menu

2.1. Edit

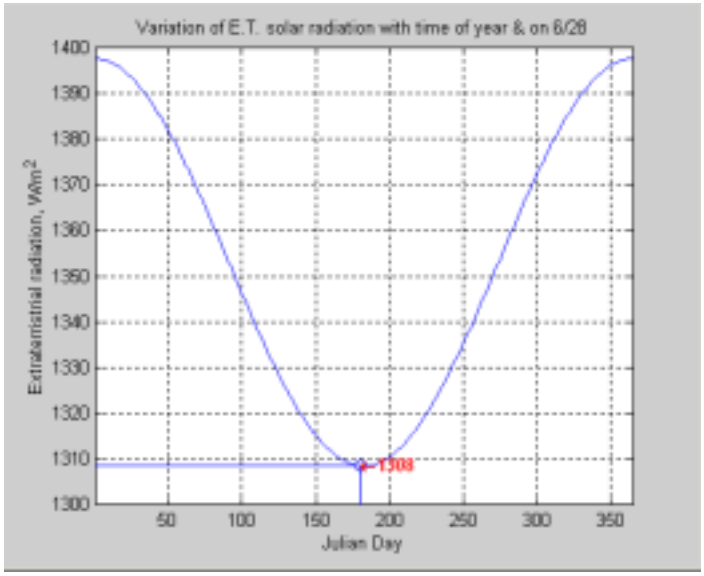
The first option provides ‘Edit’ function, allows users to set the date for further calculation. Users can enter a number between 1 to 365. The program will calculate the corresponding calendar day and displayed as shown in the figure.



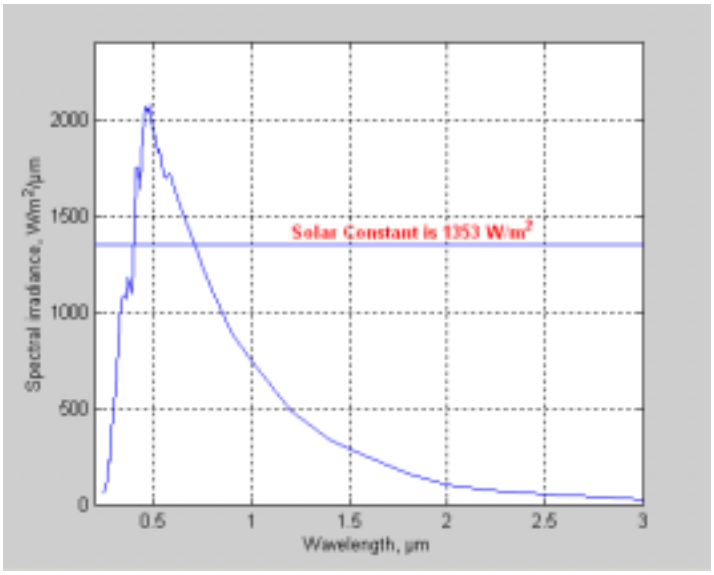
2.2. Radiation



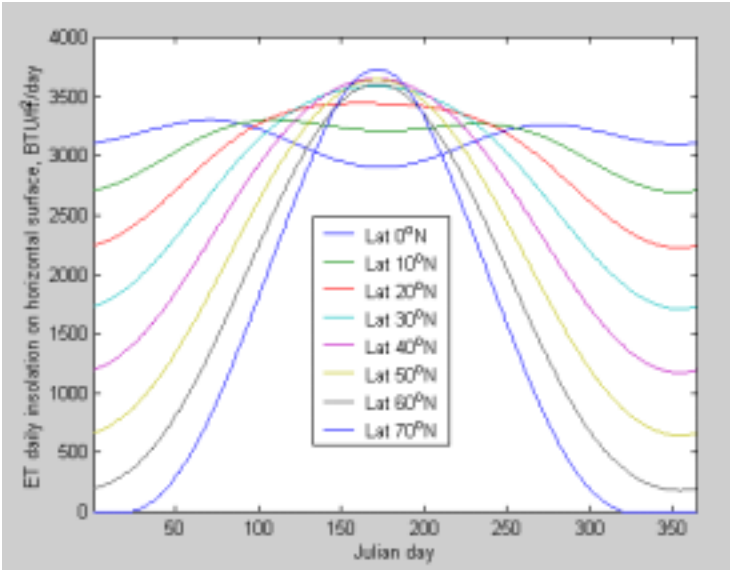
2.2.1. ET Radiation



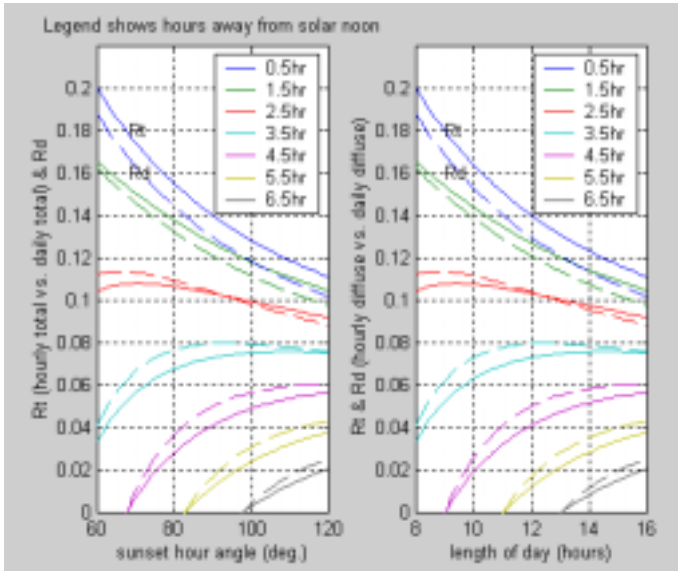
2.2.2. ET Solar Irradiance



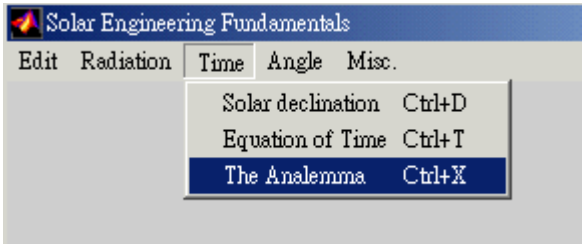
2.2.3. ET Solar Irradiance



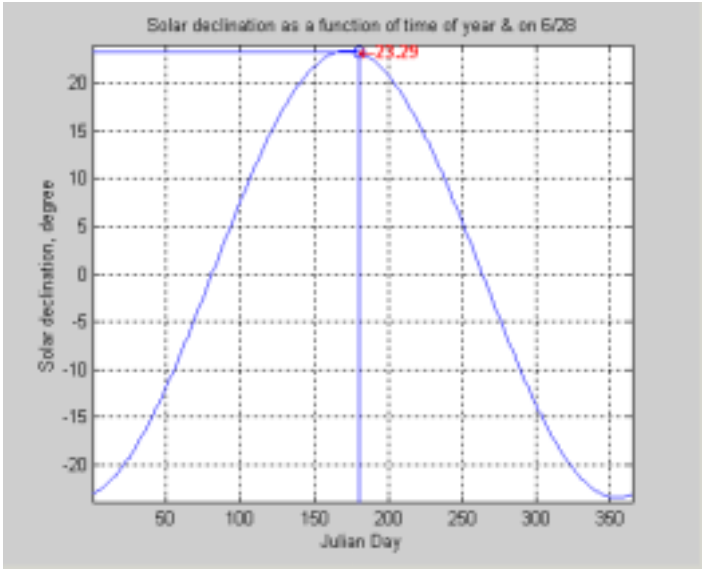
2.2.4. ET Hourly ratio



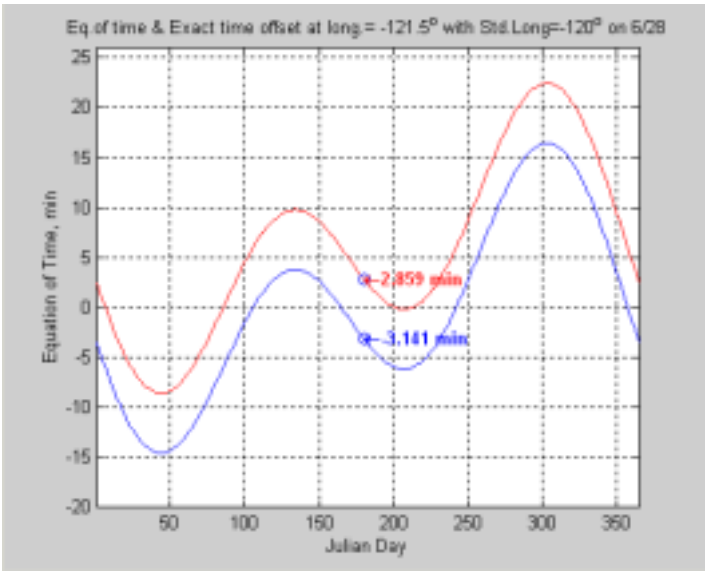
2.3. Time



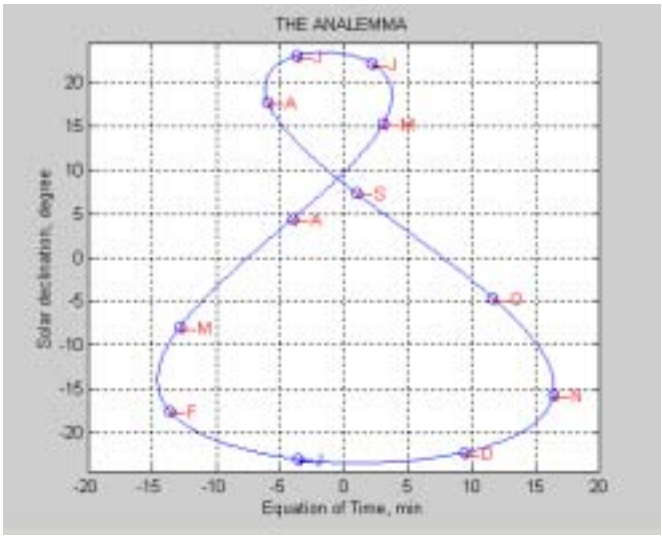
2.3.1. Solar declination



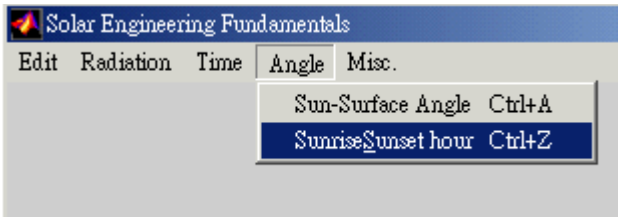
2.3.2. Equation of Time



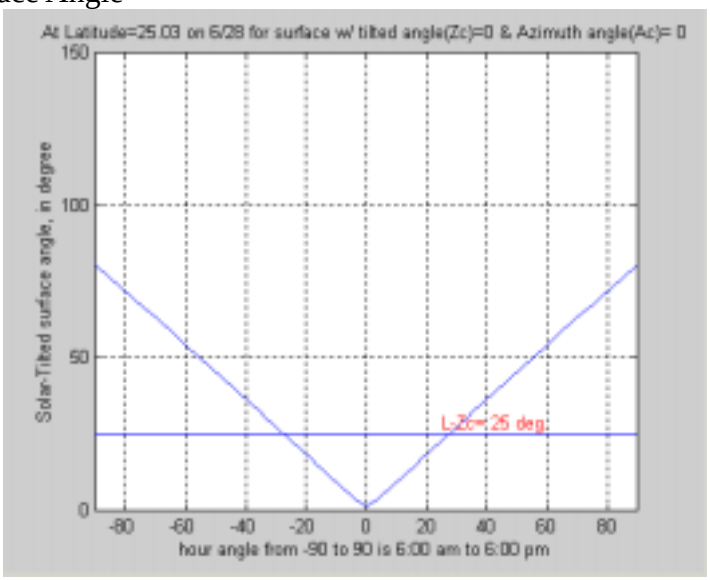
2.3.3. The Analemma



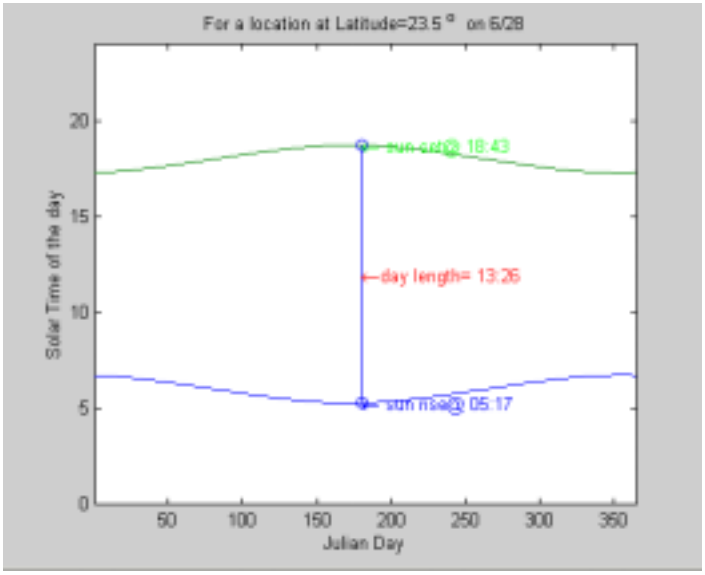
2.4. Angle



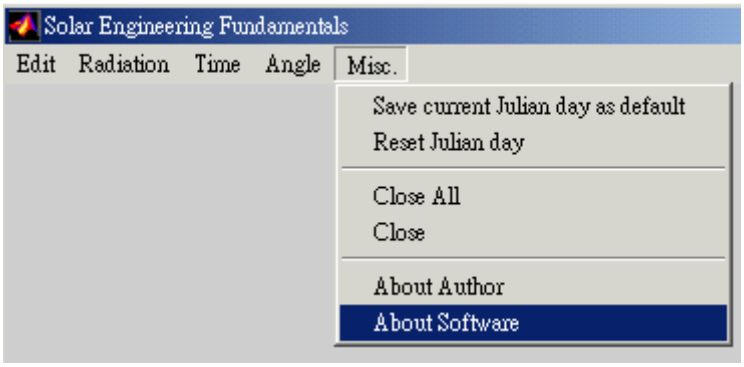
2.4.1. Sun-Surface Angle



2.4.2. Sunrise-sunset hour



2.5. Misc.



3. Related files

There are two files related to this program, they are ‘solar0.m’ and solar.dat’. The first file is the **MATLAB** source code and the second file containing the default Julian day.

4. Source code

Please download ‘**solar0.m**’ file from the internet.