Solar Facilities for the European Research Area

Deliverable 12.2 : Optical models for Concentrating Systems : PROMES-CNRS Optical Model

Explanation of the « Themis_Field_SolTrace » file

⚠ First of all, to use properly the excel file, the decimal must be a point and not a comma (to change that, go to the control panel and to the local/linguistic options)

The "Themis_Field_SolTrace.xlsx" file consists of five sheets:
1. Sun position
2. Heliostats position
3. Absorber+tower position
4. Calculation heliostats
5. SolTrace Data

1. Sun position
In the "Sun position" sheet, the user indicates the latitude of the site, the DOY (day of year, between 1 and 365) and the UTC hour. These data define a sun unit vector that must be copied and pasted in SolTrace.

2. Heliostats position
The user must not modify this sheet. It gives the coordinates of each heliostat in a specific basis. These coordinates are considered in the "Calculation heliostats" sheet.

3. Absorber+tower position
In this sheet, the coordinates of the PEGASE and the Mini-Pegase focus points are given (rows 2 and 3). The origin of the basis (0,0,0) is the bottom of the tower. The x-axis and z-axis are orientated towards the west and north, respectively. The y-axis represents the height. The user specifies the target dimensions (row 5), the aiming point (row 6) and the tilt angle of the receiver (row 7). In the basic design, the receiver is considered without cavity. The user can change this feature (row 9); in that case, the cavity walls are added by the user. Rows 11 and 12 correspond to the data (relative to the receiver and the tower) that must be copied and pasted in SolTrace.

4. Calculation heliostats

The user must not modify this sheet. It calculates the orientation of each heliostat, by considering the sun position and the focus point.

5. SolTrace Data

The user must not modify this sheet. This sheet gives all the data, relative to the heliostats, that the user copies and pastes in SolTrace. These data take into account the sun position and the aiming point. Each heliostat consists of 9 modules. For example the heliostat B01 is represented by the rows 5 to 13. A figure shows the position of all the heliostats in the field. Thus the user can choose the heliostats that he wants to consider for the optical simulation.

Concerning the optical properties, we suggest:
- For the heliostats: a reflectivity of 92%, a RMS slope error of 1.5 mrad and a RMS specularity error of 0 mrad (corresponding to the file "heliostat.opt"). If the user wants to simulate a heliostat field with ideal optical properties, the RMS slope/specularity error must be set to 0 mrad.
- For the tower: a reflectivity of 0% and a RMS slope/specularity error of 0 mrad (corresponding to the file "tower.opt")

Concerning the absorber, the user chooses its optical properties.

If you need any more information, please write an email to: **contact-sfera@sollab.eu**