PERFUM Python Camp 2023

Chapter 5 : Data with Pandas

- pandas is a fast, powerful, flexible tools in Python for data analysis and data manipulation tools.
- To call pandas in python, we need to do:

  import pandas as pd
- As we learn in data arrays, python read data in. rows not column. This is a bit tricky if we are dealing with large amount of data for example 100 x 100 data.
- pandas is the solution to read data from large files and make the computation easier.
- pandas can read various format of data including text file, excel, csv.
- In our first example, we are going to read a solar spectral data stored in excel. This data contained two columns, which are wavelength in nm and spectral irrandiance in W m^{-2} nm^{-1} from observation with ~1697 rows of data. This data is an example of black body radiation data.

  The program:

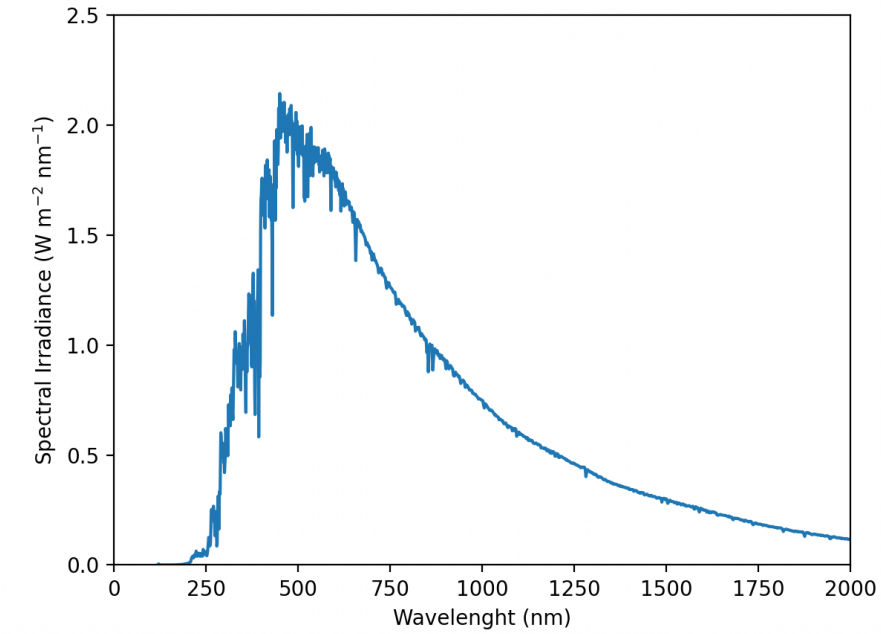
```python
#This program shows how to read data from excel file
#The data given in this example is a Standard Solar Spectra

#import libraries
import matplotlib.pyplot as mpl
import numpy as np
import pandas as pd

#first read the excel file using pandas
nama=['wave','irr']
df=pd.read_excel('solar_spectra.xlsx',header=0,names=nama)
#print(df['wavelength'],df['irradiance'])
x= df['wave']
y=df['irr']

print(y)
mpl.plot(x,y)
mpl.xlim(0,2000)
mpl.ylim(0.0,2.5)
mpl.xlabel('Wavelenght (nm)')
mpl.ylabel('Spectral Irradiance (W m$^{-2}$ nm$^{-1}$)')
mpl.show()
```

  The output:



We can include the formulation of black body radiation in the plot to fit the data.