```
NASA/POWER SRB/FLASHFlux/MERRA2/GEOS 5.12.4 (FP-IT) 0.5 x 0.5 Degree Daily Average Data
Dates (month/day/year): 01/01/1996 through 12/31/2019
Location: Latitude  -21.3444   Longitude 55.4728
Elevation from MERRA-2: Average for 1/2x1/2 degree lat/lon region = 127.07 meters Site = na
Climate zone: na (reference Briggs et al: http://www.energycodes.gov)
Value for missing model data cannot be computed or out of model availability range -999
Parameter(s):
ALLSKY_SFC_SW_DWN SRB/FLASHFlux 1/2x1/2 All Sky Insolation Incident on a Horizonta Surface (kW-hr/m^2/day)
PRECTOT MERRA2 1/2x1/2 Precipitation (mm day-1)
QV2M MERRA2 1/2x1/2 Specific Humidity at 2 Meters (g/kg)
WS10M MERRA2 1/2x1/2 Wind Speed at 10 Meters (m/s)
T2M MERRA2 1/2x1/2 Temperature at 2 Meters (C)
PS MERRA2 1/2x1/2 Surface Pressure (kPa)
```

Entrée [42]:

```python
import pandas as pd
import numpy as np
df=pd.read_csv('dataset_climate_science.csv')
```

Entrée [43]:

```python
df.mean(axis=0)
```

Out[43]:

```
LAT       -21.344390
LON        55.472810
YEAR     2007.498973
MO          6.522930
DY         15.729637
PREC        1.982055
P         100.251909
H          14.463475
T          24.385940
W           5.575186
I           4.178522
dtype: float64
```

Entrée [44]:

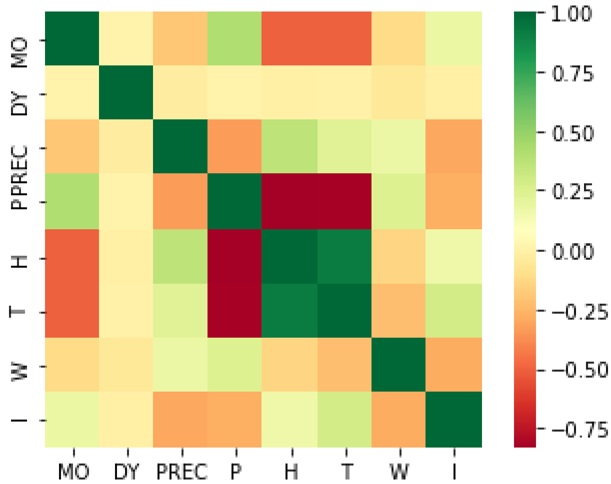
```python
df[df==-999]=np.nan
df=df.fillna(df.mean())
```

Entrée [45]:

```
df=df.iloc[:,3:11]
import seaborn as sns
sns.heatmap(df.corr(), square=True, cmap='RdYlGn')
```

Out[45]:

<AxesSubplot:>

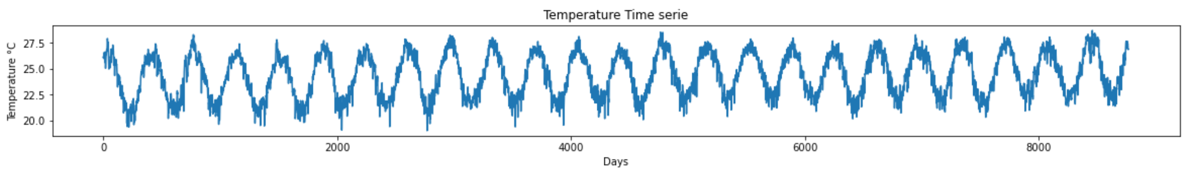



Entrée [46]:

```
import matplotlib.pyplot as plt
plt.figure(figsize=[20,2])
plt.title('Temperature Time serie')
plt.xlabel('Days')
plt.ylabel('Temperature °C')
T=df['T']
plt.plot(np.arange(0,len(T),1),T)
```

Out[46]:

[<matplotlib.lines.Line2D at 0x13c44523088>]

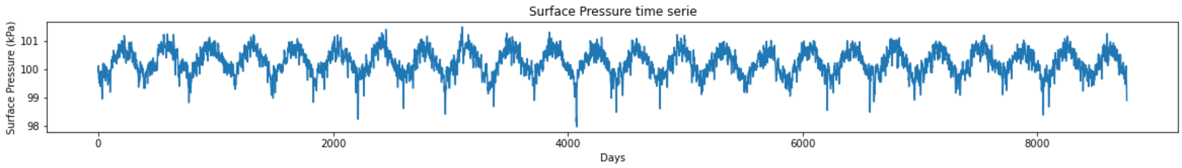


Entrée [65]:

```python
plt.figure(figsize=[20,2])
plt.title('Surface Pressure time serie')
plt.xlabel('Days')
plt.ylabel('Surface Pressure (kPa)')
P=df['P']
plt.plot(np.arange(0,len(P),1),P)
```

Out[65]:

```
[<matplotlib.lines.Line2D at 0x13c41c5b708>]
```

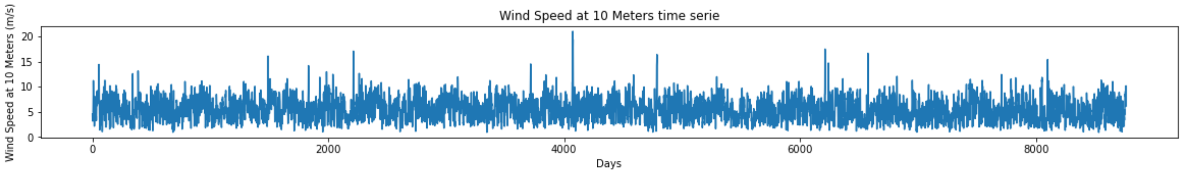



Entrée [67]:

```python
plt.figure(figsize=[20,2])
W=df['W']
plt.title('Wind Speed at 10 Meters time serie')
plt.xlabel('Days')
plt.ylabel('Wind Speed at 10 Meters (m/s)')
plt.plot(np.arange(0,len(W),1),W)
```

Out[67]:

```
[<matplotlib.lines.Line2D at 0x13cbd35a088>]
```

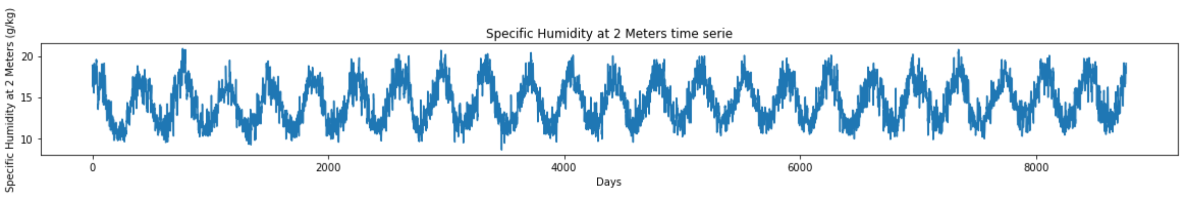



Entrée [66]:

```python
plt.figure(figsize=[20,2])
H=df['H']
plt.title('Specific Humidity at 2 Meters time serie')
plt.xlabel('Days')
plt.ylabel('Specific Humidity at 2 Meters (g/kg)')
plt.plot(np.arange(0,len(H),1),H)
```

Out[66]:

```
[<matplotlib.lines.Line2D at 0x13c4c467dc8>]
```

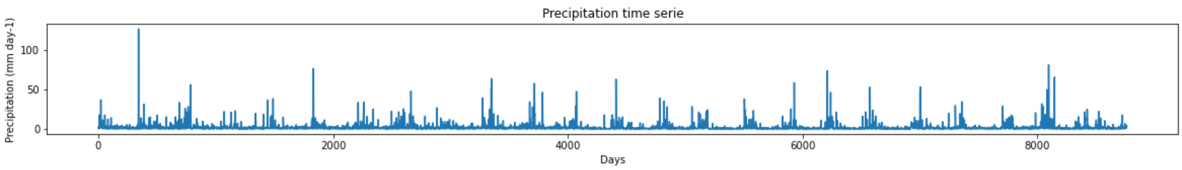


Entrée [68]:

```python
plt.figure(figsize=[20,2])
PREC=df['PREC']
plt.title('Precipitation time serie')
plt.xlabel('Days')
plt.ylabel('Precipitation (mm day-1)')
plt.plot(np.arange(0,len(PREC),1),PREC)
```

Out[68]:

```
[<matplotlib.lines.Line2D at 0x13c7fc39088>]
```

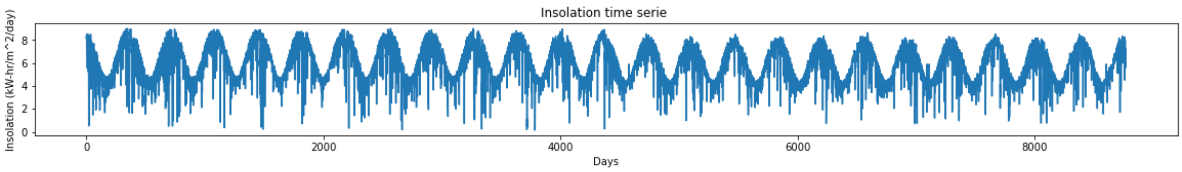



Entrée [69]:

```python
plt.figure(figsize=[20,2])
I=df['I']
plt.title('Insolation time serie ')
plt.xlabel('Days')
plt.ylabel('Insolation (kW-hr/m^2/day)')
plt.plot(np.arange(0,len(I),1),I)
```

Out[69]:

```
[<matplotlib.lines.Line2D at 0x13cebd4d708>]
```




```
I :  The daily average amount of the total solar radiation incident on a horizonta
surface at the surface of the earth.
(kWh/m²/day)
```

Entrée [53]:

```python
X = df[['MO','DY','PREC','P','T','W','H']].values
y = df['I'].values
```

```
sklearn.ensemble.AdaBoostRegressor
sklearn.ensemble.BaggingRegressor
sklearn.ensemble.ExtraTreesRegressor
sklearn.ensemble.GradientBoostingRegressor
sklearn.ensemble.HistGradientBoostingRegressor
sklearn.ensemble.RandomForestRegressor
```