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TMY EVALUATION FOR POWER GENERATION IN GRAN CANARIA, SPAIN

UNIVERSIDAD DE LAS PALMAS DE GRAN CANARIA

SIANI INSTITUTO UNIVERSITARIO INGENIERIA COMPUTACIONAL

SOLAR RADIATION DATA AVAILABLE IN THE ISLAND OF GRAN CANARIA

PREPARATION OF TYPICAL METEOROLOGICAL YEAR (TMY)
TMY Series describe the daily global solar irradiation or the daily sunshine duration

Generating one year duration series

This paper obtains the maximums, means, medians, variance and percentiles of 90% & 75% series

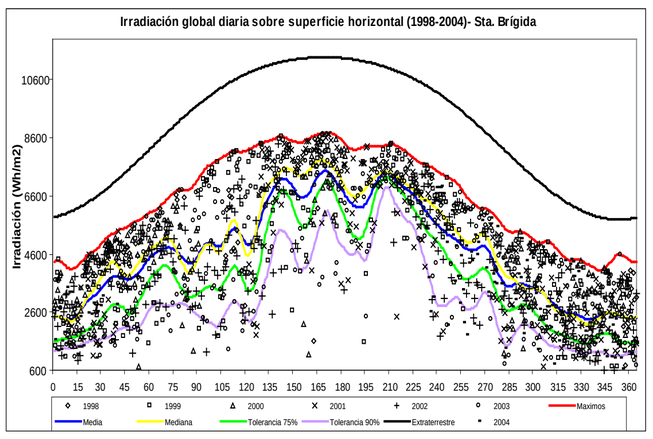
Maximum serie

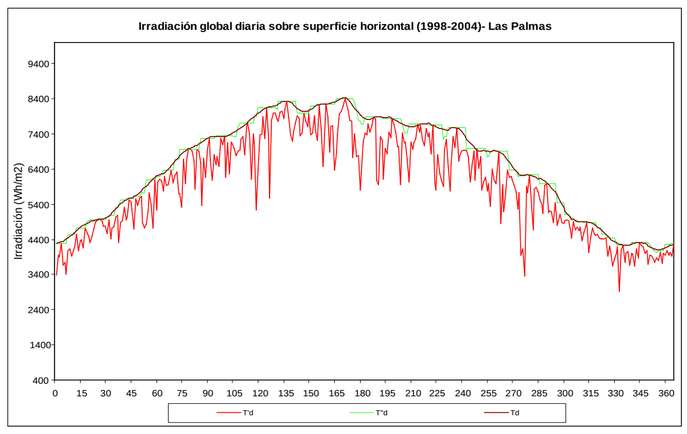
Initial irregular data, Z_{ad}

1º - Obtain daily maximum value, $T`_d$

2º - Obtain eleven days maximum value, $T``_d$

3º - Using weight means to smooth the irregular data T_d





SOLAR IRRADIATION MODELS USED

•ESTIMATION OF TMY, RUIZ, V.

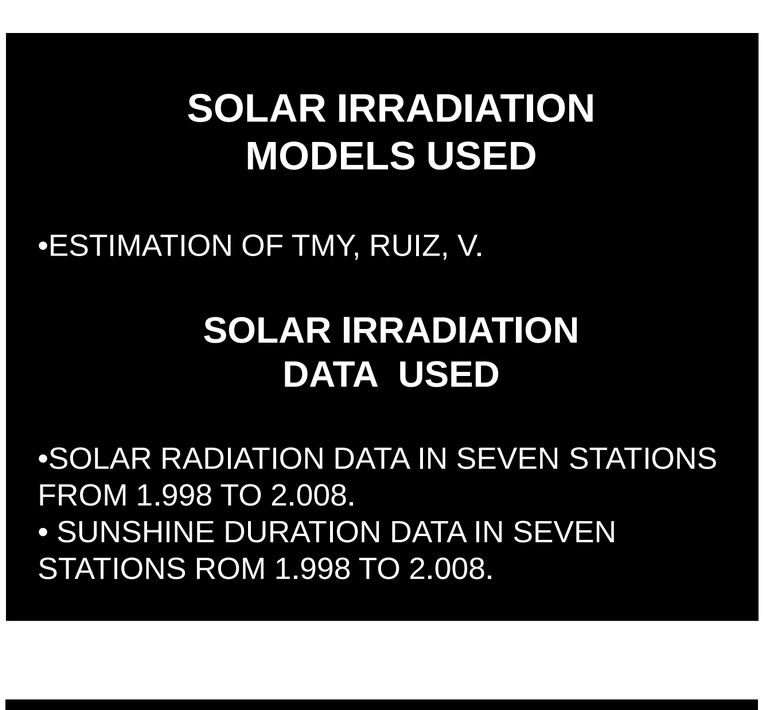
SOLAR IRRADIATION DATA USED

•SOLAR RADIATION DATA IN SEVEN STATIONS FROM 1.998 TO 2.008.
• SUNSHINE DURATION DATA IN SEVEN STATIONS ROM 1.998 TO 2.008.

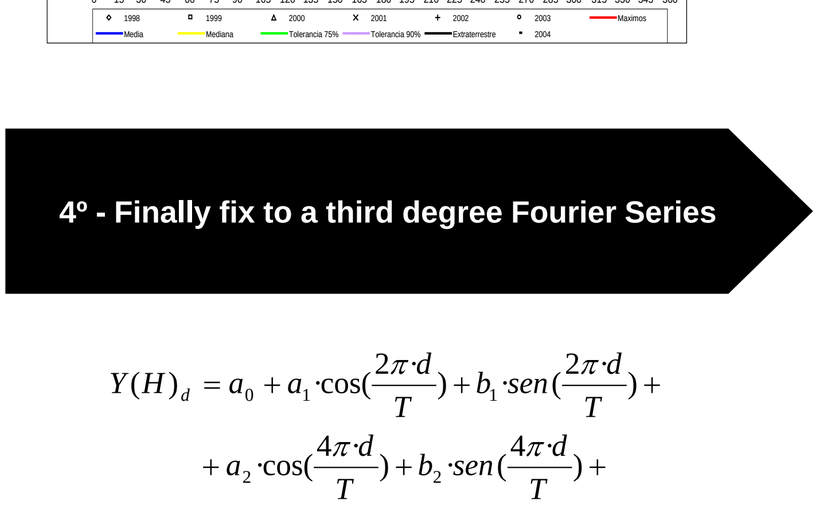
4º - Finally fix to a third degree Fourier Series

$$Y(H)_d = a_0 + a_1 \cdot \cos(\frac{2\pi \cdot d}{T}) + b_1 \cdot sen(\frac{2\pi \cdot d}{T}) + a_2 \cdot \cos(\frac{4\pi \cdot d}{T}) + b_2 \cdot sen(\frac{4\pi \cdot d}{T}) + a_3 \cdot \cos(\frac{4\pi \cdot d}{T}) + b_3 \cdot sen(\frac{4\pi \cdot d}{T})$$

SOLAR IRRADIATION MEASUREMENT STATIONS

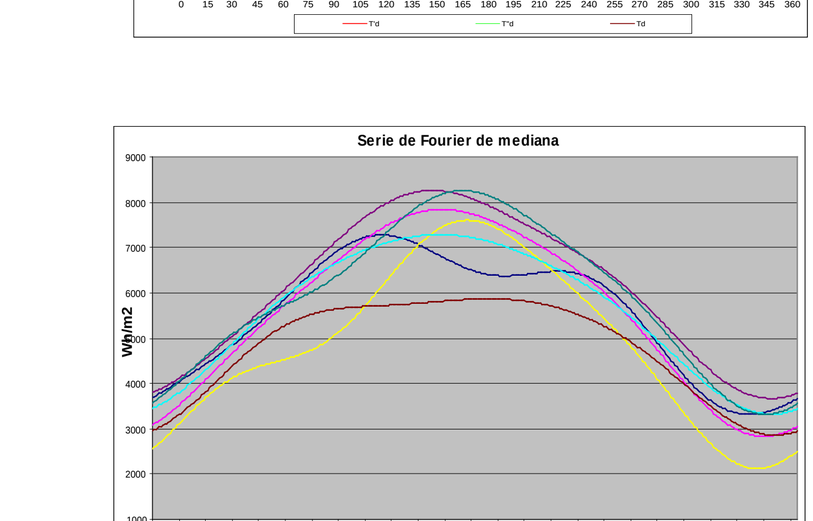


The Maximum TMY series follow an annual Tendency similar to clear sky condition in seven locations



In southern stations most of the days present s clear sky conditions, so Median TMY series are quite regular and similar.

The Median TMY series is considering the real Trend of global irradiation behaviour in every location.



In northern stations, the irradiation suffers a descent during the summer months. This effect is caused by the cloudiness generated by the Trade Winds a long the northern face of the Island.

The different between northern and southern stations suggests a different treatment to develop an irradiation model from other meteorological data, and point south part of the island as the most suitable for solar generation.

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