



## **On extreme daily air temperature at Athens, Greece**

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Changes in climate variability and extremes of weather have been examined in a local, regional or global scale during the last few years. The interpretation of these changes is difficult because of the interactions between the changes in the mean and the variability of the climatic variable's statistical distribution. With respect to air temperature variable, increases in both the mean and the variability are possible and affect the probability of hot and cold extremes, with more frequent hot events with more extreme high temperatures and fewer cold events, according to IPCC.

In this study, we examine the changes in daily air temperature (mean, maximum and minimum) records at the National Observatory, Athens, during the period 1897-2006. In order to understand the observed changes, the normal distribution fit with the mean daily air temperature datasets per ten years and thirty years as well. The results show that an increase in the variability is observed from the beginning of the twentieth century till 1940's while the variability decreases up to 1970's and further to increases till nowadays. The mean of the air temperature distribution presents similar variation, remaining rather stable during the period 1920-1970.

In the process, in order to study the air temperature extremes we evaluated percentile and threshold climatic indices. The percentile indices concern: cold nights (the number of days with minimum temperature below the 10th percentile from the 1961-1990 reference period), warm nights (the number of days with minimum temperature above the 90th percentile from the 1961-1990 reference period), cold days (the number of days with maximum temperature below the 10th percentile from the 1961-1990 reference period) and warm days (the number of days with maximum temperature above the 90th percentile from the 1961-1990 reference period). The absolute indices concern:

frost days (number of days with minimum temperature below 0 oC) and summer days (number of days with maximum temperature above 25 oC) and the diurnal temperature range. Our findings show that negative trends exist for cold nights, but significant trends for warm days and nights were revealed, especially the last two decades.