



AWS-CON bias description with the Spanish DAAMEC dataset

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In this work, produced under the recently finished project DAAMEC- CGL2012-32193, we analyze the DAAMEC dataset of daily maximum and daily minimum temperature composed by 46 different collocated parallel measurements in Spain with the objective of describing the introduced bias and its impact over historical series. Each pair comprises an Automatic Weather Station (AWS) and a conventional (CON) thermometer. The total number of paired observations of daily maximum temperature and daily minimum temperature is 88.617. The entire dataset has been submitted to quality control tests, performed over the AWS, CON and AWS-CON series, removing from further analysis roughly 0.1% of the values.

Unfortunately, in historical series, the AWS-CON bias does not appear isolated from other sources of inhomogeneity, but appears confounded with additional biases, caused by changes in the station's surroundings or alterations of either the manual or the automatic sensor or their sheltering. For this reason, and after quality control, the CON-AWS series have been checked for internal inhomogeneities, identifying more than 100 segment. For a given station, each segment represents a relation between the CON and the AWS measurements, thus a different bias.

Even though the study of the bulk of the data suggest the tendency toward a warmer AWS measurements during the day and a cooler AWS values during nighttime, this statement hides an enormous range of different situations, across different stations and, inside each site, across different segments and also a wide variety of impacts over long term series. This work also analyses this variety by analyzing selected segments.