

Interactive comment on “Increasing cloud cover in the 20th century: review and new findings in Spain” by A. Sanchez-Lorenzo et al.

Anonymous Referee #2

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General comments: The paper concerns the long-term trends in total cloud cover. It gives a review of existing papers on such trends all over the world and analyses the trends in Spain in the period 1866–2010. The paper addresses relevant scientific question because cloud cover exert a strong impact on short- and long-wave radiation reaching the Earth surface. The scientific methods are valid but it is not clear how many variables are taken into account in PCA analysis: 39 stations \times 12 months or 39 stations with monthly values. Are total cloud cover anomalies calculated relating to average from all months or relating to specific calendar months (i.e. the annual course is partially removed). The increase of total cloud cover in the period from the beginning of record up to 1960s was shown with the decrease from 1970s to the end of the record. The changes of total cloud cover in Spain are in line with those in Europe and other regions of the world. However such widespread increase in total cloud cover

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should have an influence on radiation. In the discussion the worldwide relation of the increase (decrease) of total cloud cover on increase (decrease) of total precipitation and decrease (increase) of diurnal temperature range. In the case of Spain only the impact on a number of rainy days is mentioned but without more detail discussion. Specific comments: 5400 land stations instead of 54000 mentioned in the text were analysed in Warren et al. (2007) paper (page 1136, line 26). It should be Tuomenvirta instead of Toumenvirta (page 1140, lines 20 and 24) and Matuszko instead of Matusko (page 1140, line 29 and page 1155, line 11).

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