Solar radiation variability over Italy in the last 55 years reconstructed for the first time

September 19 2016

Surface solar radiation variability over Italy from the end of the 1950s has been reconstructed in the framework of a cooperation between Milan University, ETH (Zurich), ISAC-CNR, Italian Air Force and IPE-CSIC (Zaragoza). The first author of the research - published on *Atmospheric Chemistry and Physics* – is a researcher of the PhD course in Environmental Sciences of Milan University.

This information – based on more than 50 daily records distributed all over the Italian territory – is completely innovative, as surface solar radiation records had never been analysed for this area.

The Italian patterns are in good agreement with the trends reported for many other sites of the world: from the end of the 1950s to the beginning of the 1980s there is a significant reduction of surface solar radiation (dimming), whereas in the last 25-30 years surface solar radiation shows a strong increase (brightening).

Both the dimming and the brightening are stronger under clear-sky than under all-sky conditions, giving evidence that cloudiness variability should not be the only cause of these signals. The main cause seems to be linked to changes in aerosol concentrations.

Specifically, the increase in anthropogenic aerosol emissions in the 1960s and 1970s is thought to be the major cause of the initial dimming, while measures to reduce air pollution are thought to be responsible for the subsequent brightening.

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