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Solar dimming/brightening in the Mediterranean

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Early analyses of solar radiation records have pointed to a widespread decline of surface solar radiation from the 1950s up to the 1980s in various parts of the world. This phenomenon was attributed to increasing air pollution and has been named "global dimming". More recent analyses with data records updated to near present suggested that surface solar radiation shows no sign of decrease anymore since the 1980s or even started to recover at many locations. This recovery has been named "solar brightening". Air pollution control and the economic breakdown of the former communist countries are the major influential factors for this transition. Further the influence of the recovery from the dimming caused by Mt. Pinatubo volcanic eruption in 1991 and internal climate variability with associated cloud variations were suggested to contribute to the brightening in the 1990s.
Despite the interest in the solar dimming/brightening phenomenon the Mediterranean area has not attracted the attention of the scientists in this respect so far. Therefore, the present work tries to fill this gap by providing spatio-temporal analysis of the incoming short-wave solar radiation in the whole area of the Mediterranean Sea in the period 1979-2004 taken from satellites. To give better spatial information about the phenomenon the Mediterranean region has been divided into three sub-regions: the West Mediterranean, from Gibraltar to Corsica, the Central Mediterranean, from Corsica to the Ionian Sea, and the East Mediterranean, from the Ionian Sea to the shores of Syria. The analysis shows that the three sub-regions have not undergone the same spatio-temporal pattern of the phenomenon probably due to the different distribution of aerosols in the region.