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Modelling the North Hemisphere temperature for the next 20 years considering the solar activity influence

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Solar cycles 24 and 25 are predicted to be low activity cycles. In the present work we attempt to model the North Hemisphere temperature for the years 2009-2031, corresponding to solar cycles 24 and 25, using a thermodynamic model. In order to assess the possible effect of reduced solar activity on temperature, we include as forcings the atmospheric CO2, and the solar activity through the Total Solar Irradiance and low cloud cover changes. The model generates clouds due to internal atmospheric processes, here we additionally consider cloud perturbations produced by solar activity. We assume that such cloud changes are originated by two solar variability-associated effects: the cosmic rays, and the emissions to the atmosphere of Methane Sulphonic Acid which is a product of the seawater algae. The role of these two processes is to form cloud condensation nuclei. We use two IPCC-2007 CO2 scenarios, one with a high fossil consumption and other with a low use of fossil sources.