



## **Simulation of the surface temperature anomalies in the North Hemisphere during the last 300 years of the Little Ice Age using a thermodynamic model.**

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The last 300 years of the Little Ice Age, are characterised by two minimum in total solar irradiance (TSI): known as Maunder Minimum and Dalton Minimum, during which the reconstruction of surface temperature show anomalies smaller than  $-0.7^{\circ}\text{C}$ .

The experiments with a energy balance model called Thermodynamic Climate Model (TCM), show that the changes in  $\text{CO}_2$  and TSI at the end of the Little Ice Age, relative to period 1961-1990, have a significant effect in the descent of temperature, mainly in the Maunder Minimum major to  $0.2^{\circ}\text{C}$ . Nevertheless the incorporation of changes in low cloud cover, which we assumed are induced by the galactic cosmic ray flux, which varies inversely with solar activity, produced the greater descent of the surface temperature in the North Hemisphere. The results of the TCM are corroborated trough a comparison with the reconstruction of surface temperature anomalies developed by some authors.