

A criterion to discriminate between solar and cosmic ray forcing of the terrestrial climate

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There is increasing evidence that there exist interstellar-terrestrial relations and that the heliosphere's effectivity to serve as a protecting shield for the Earth, specifically against neutral atoms and cosmic rays, is varying in time. Nonetheless, a debate is going on whether the Sun or the cosmic rays are driving the terrestrial climate, particularly on periods of hundred years and shorter. As the modelling of the transport of cosmic rays in the heliosphere has evolved from pure test particle simulations to far more consistent treatments, one can explain various correlations within the framework of physical models and one can make quantitative predictions regarding terrestrial indicators of interstellar-terrestrial relations. This level of understanding and modelling allows to identify a criterion with which one can discriminate between solar and cosmic ray forcing on a period of several decades. We define this criterion and discuss related existing observations.