

Can we use the aa geomagnetic activity index to predict partially the variability in global mean temperatures?

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Data for geomagnetic activity index aa and solar sunspot number R_z for 1868-2004 were subjected to correlation analysis with the global surface temperature (GST). The annual-means GT show that it had two warming phases and one cooling period. Observations of the Earth's near-surface temperature showed a global-mean temperature increase of approximately 1.1°C since 1877, occurred from 1887 to 1940 and from 1970 to the 1998. The temperature change over the past 35 years (1970-2004) is unlikely to be entirely due to internal climate variability. Attribution of the warming early in the century has proved more elusive. The correlation analysis between the variation of global temperature and both aa geomagnetics and solar activity are $+0.5 \pm 0.05$, for any lag or lead, indicating a significant role in such variation. All graphs have illustrated strong correlations between the solar activity and geomagnetics and surface global temperature. Our results do not, by any means, rule out the existence of important links between solar activity and terrestrial climate. Our results displayed that the present changes in aa geomagnetics may reflect partially some future changes in the global surface temperatures.