



Possible effects of space weather on cloud cover and dependence on cloud composition and altitude

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Clouds play an important role in the terrestrial radiation budget. We focus here on assessing possible effects of IMF variations on cloud cover at different altitudes. Since the variability of the solar irradiance itself is too small to explain its influence on climate parameters, indirect effects of solar variability on climate were and are investigated, based on mechanisms involving other solar proxies, such as cosmic rays (CR), solar ultraviolet irradiance (UVI), interplanetary magnetic field (IMF). Links have been found between geomagnetic activity and surface temperature or atmospheric dynamics. Possible relationships between the orientation of IMF components and various atmospheric parameters have been suggested. The extraterrestrial electric field affects the global electrical circuit on Earth, which, in turn, could play a role in cloud formation. It has been shown that, if existing, the solar modulation of cloud cover varies with location and altitude of clouds. Thus the effects of IMF variation on cloud cover might also depend on cloud altitude and/or composition (i. e. – liquid/ice clouds, low/middle/high clouds). The cloud cover and the solar wind data cover two solar cycles (1984 – 2009). Preliminary results show that an effect might exist, depending on composition and altitude of clouds. The possible relationship is not uniquely defined at global level, varies strongly for different geographical places and its pattern seems to follow the distribution of oceanic currents. Possible reasons of these findings are suggested.