Cosmic ray decreases affect atmospheric aerosols and clouds - DTU Orbit (11/12/2018)

Cosmic ray decreases affect atmospheric aerosols and clouds
Close passages of coronal mass ejections from the sun are signaled at the Earth's surface by Forbush decreases in cosmic ray counts. We find that low clouds contain less liquid water following Forbush decreases, and for the most influential events the liquid water in the oceanic atmosphere can diminish by as much as 7%. Cloud water content as gauged by the Special Sensor Microwave/Imager (SSM/I) reaches a minimum ≈7 days after the Forbush minimum in cosmic rays, and so does the fraction of low clouds seen by the Moderate Resolution Imaging Spectroradiometer (MODIS) and in the International Satellite Cloud Climate Project (ISCCP). Parallel observations by the aerosol robotic network AERONET reveal falls in the relative abundance of fine aerosol particles which, in normal circumstances, could have evolved into cloud condensation nuclei. Thus a link between the sun, cosmic rays, aerosols, and liquid-water clouds appears to exist on a global scale.

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