

## Solar-influenced atmospheric electricity changes and observations of clouds

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Clouds have been suggested to be influenced or enhanced by cosmic ray ionisation, for which two physical mechanisms have previously been proposed. These are: (1) production of ultra-fine aerosol particles by high energy ionisation and (2) the effect of aerosol particle and droplet charging at layer cloud boundaries. As substantial claims for derived climate impacts have been made, these mechanisms are being scrutinised in increasing detail. The second mechanism is considered further here, which depends on current flow in the global atmospheric electrical circuit and evidence for solar modulation of the global circuit by cosmic rays is reviewed. Surface solar radiation measurements are used to infer long term variations in cloud, in combination with long term atmospheric electricity data made by the UK Met Office. Cloud processes linking a cloud edge with bulk cloud properties are complex, but observations using a balloon-carried cloud edge charge detector do demonstrate fair weather electrification of cloud edges.