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Charge measurements on non-thunderstorm cloud edges

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One possible method of solar-terrestrial coupling is the modulation of cloud by cosmic ray ionisation. Theory predicts that near the upper and lower boundaries of layer clouds, unipolar charge regions occur, generating highly charged droplets and aerosol particles. The effects of charge on cloud microphysical processes are largely unexplored, and only a few direct in situ atmospheric measurements have been made. Because of the radiative importance of clouds and the possibility of widespread small effects of charge on cloud processes, more in-situ measurements to evaluate charge effects in the fair weather cloud boundary region are desirable. To undertake such measurements, a sensor is described, which is capable of operating at high vertical resolution. The sensor has been flown alongside a meteorological radiosonde, and on several ascents has frequently detected thin layers of charge on cloud edges.