

**L219-003**

**Room: 101A**

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## Modeling solar effects on the global circuit, cloud charging, and cloud microphysics

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Changes in the distribution of current density through the global electric circuit are caused by internal changes as well as several types of solar activity. The solar forcing includes the solar modulation of the galactic cosmic ray flux, solar energetic particle events, the coupling of solar wind electric field into the polar cap regions, and the precipitation of relativistic electrons from the radiation belts. The downward current density from the ionosphere to the surface (land and ocean) passes through clouds, and produces space charge at cloud boundaries. The space charge accumulates mostly on droplets and aerosol particles (including cloud condensation nuclei and ice-forming nuclei) and the charges on particles and droplets are large enough to affect the scavenging processes and concentrations of these nuclei. Our models of these processes and inferred consequences for cloud cover and precipitation will be discussed.