

Title: Lightning Observations from the Space Shuttle

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Significant Accomplishments:

Motion pictures have been taken at night from the space shuttle that show lightning discharges spreading horizontally at speeds of 10^5 m sec⁻¹ for distances over 60 km. Tape recordings have been made of the accompanying optical pulses detected with a photocell optical system. The observations show that lightning is often a mesoscale phenomenon that can convey large amounts of electric charge and energy derived from an extensive cloud system into a cloud-to-ground discharge.

Focus of Current Research Activities:

Several video tape recordings of lightning discharges have been obtained on shuttle flights since the termination of the NOSL program. The size and location of the lightning illuminated cloud images is now being analyzed, and comparisons are made with meteorological data concerning the cloud system obtained from the McIDAS.

Plans for FY-85:

Analysis of any lightning pictures taken during current space shuttle flights will be analyzed and correlated with McIDAS data. Experimental equipment will be devised for automatically recording on video tape images and optical signals produced by lightning. This equipment will then be engineered in cooperation with Marshall Space Flight Center for installation in a canister to be flown in the payload bay of the shuttle.