

A DIGITAL REAL-TIME LIDAR DATA RECORDING,  
PROCESSING, AND DISPLAY SYSTEM\*

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ABSTRACT

Digital data handling electronics have been added to the Stanford Research Institute Mark IX mobile lidar system. The digital system consists of a transient recorder, a minicomputer with extended memory, a dual tape transport, a digital raster display system that allows operator interaction with the data processing, and an input/output teletype device.

The digital representation of the lidar backscatter signature is read by the computer in real time and is immediately written on magnetic tape for future analysis. This operation is of highest priority and interrupts any computation being carried out by the processor when the lidar is fired. Of second priority is the correction of the backscatter signature for the inverse range-squared dependence and instrumentation response functions and the display of these results in both intensity modulated (16 gray scale picture format) and A-scope form. The display allows the operator to view previously collected data that is useful for directing data collection and choosing real-time analysis techniques. Third priority on the time of the processor is the inference of aerosol or cloud physical and optical properties from analysis of single or multiple lidar signatures.

Application of the digital system to the real-time inference of cirrus cloud density (number density and ice water content) will be demonstrated and other applications will be discussed.

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