

EXPERIMENTAL STUDY OF THE RADIATIVE AND THERMAL
EFFECTS OF AEROSOL LAYERS

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ABSTRACT

The concentration of airborne particulate material over populated land areas has been generally increasing during the past few decades. The resulting concern regarding the possibility of inadvertent modification of global and regional climate has recently produced a variety of theoretical models that predict the form and magnitude of these possible changes. To date, however, the various (and in some cases conflicting) model predictions remain untested because of a lack of suitable experimental data regarding the nature and effects of aerosol pollution.

To obtain pertinent atmospheric data on a continuous basis for study of aerosol effects, a newly constructed television tower located in San Francisco and extending above and below the typical height of the west coast temperature inversion is being instrumented. Vertical profiles of solar radiation, lidar measurements of aerosol layer structure, and surface measurements of solar and terrestrial radiation, aerosol size distribution and aerosol scattering coefficient will be obtained to characterize the nature and effects of urban aerosol layers. Supplementary meteorological data will also be available from an associated study of internal gravity waves by San Jose State University, utilizing the same tower. The overall data base will be analyzed to develop an integrated picture of aerosol structure and resulting radiative effects in relation to the prevailing meteorological situation. Results of this analysis are to be interpreted in terms of current models of aerosol climatological effects.

This paper will discuss the experimental facilities and summarize the first data collection period scheduled for May and June of 1974.

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