Elastic Lidar Measurements in Megacity Impacts on Regional and Global Environments-Mexico City Pollution Outflow Field Campaign (MIRAGE-Mex)

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This award supports the deployment of a mobile elastic lidar system for measurements of the radiative properties of aerosols at various distances from Mexico City during the Megacity Impacts on Regional and Global Environments – Mexico City experiment (MIRAGE-Mex). The goal of MIRAGE is to study the chemical and physical transformations of gaseous and aerosol pollutants in the outflow from Mexico City, currently the world's second largest metropolitan area. This project involves the fielding of an elastic lidar system and supporting equipment. The use of a mobile lidar will allow the characterization of the location, concentration, extent and persistence of the Mexico City plume as it transports into the surrounding regions. The mobility of the system will allow connections to be made between aerosols in one area and their sources upwind. These measurements will help to address issues relating to changes in aerosol size, shape and composition with time. The lidars will provide information on the height, backscatter and attenuation coefficients and relative density of aerosols in the atmosphere, as well as the height of the boundary layer, the entrainment parameter, and the amount, height and optical depth of cloud layers. Ultimately, the information this proposal will provide will be used to develop methods to mitigate the effects of emissions into the atmosphere. The project will provide valuable research experience to several graduate students.