Georgia Tech

Research News

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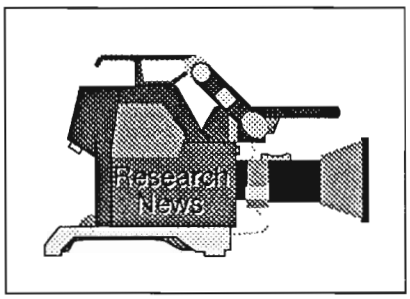

GEORGIA TECH VIDEO:

LIDAR DETECTS AEROSOLS FROM MT. PINATUBO IN SKIES OF SOUTHEASTERN U. S.

September 18, 1991

Three months after its June 4 eruption, Mount Pinatubo in the Philippines is having an influence on the atmosphere of the Southeastern United States.

Using a light detection and ranging system (LIDAR), Georgia Institute of Technology scientists have recorded the presence of aerosols from the eruption in the atmosphere over Atlanta. The spherical aerosol particles are concentrated about 13 to 15 miles above the earth's surface, according to Dr. Gary Gimmestad, principal research scientist with the Georgia Tech Research Institute (GTRI).

VISUALS AVAILABLE:

*** Green laser beam shooting vertically into the night sky.**
*** Tech personnel operating lidar equipment.**
*** Interview with Dr. Gary Gimmestad.**
*** Computer creating graphs that show changing aerosol concentrations the lidar has detected.**
*** Sunset; mountains on a sunny day; person walking outdoors on a fall day.**

The lidar the scientists use works like this: First, a green laser beam the width of a pencil is shot vertically into the air. The beam scatters when it hits particles such as the aerosols gathered in the stratosphere. Then, some of the light scattered back toward the earth is collected with a telescope, directed toward a detector and converted from light into an electrical signal. That signal travels into a computer, where the presence of aerosols registers on a computer screen as a series of peaks in a usually smooth graph line.

The time the laser light takes to leave and return to earth tells scientists where the aerosols are, and the strength of the signal indicates their concentration.

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The scientists generally make lidar measurements one to two weeks apart. Over the past three months they've seen two layers of aerosols, which hang in different areas of the stratosphere at different times.

Gimmestad expects future lidar readings to show aerosol concentrations peaking and then dropping over the next two years, as global winds spread the particles from the equatorial region throughout the earth's atmosphere. The particles will eventually settle in raindrops and ice crystals contained in clouds, falling to the earth as acid precipitation.

In the meantime, those in affected areas will see brilliant red sunsets and may feel cooler temperatures, both due to the particles' reflectance of sunlight.

When it is not detecting the presence of aerosols, the lidar has many other applications. Georgia Tech scientists have used lidar to study the heights of clouds -- important because a slight change in clouds can affect and counteract the presence of carbon dioxide, thus influencing global warming tendencies. Scientists are also preparing the lidar for 1992 participation in a federal study measuring pollutant concentrations in Atlanta, along with variables that affect those concentrations.

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For more information or to request a copy of the tape, please call Lea McLees or John Toon at (404) 894-3444. Dr. Gary Gimmestad can be reached at (404) 894-3357.