During the period of this grant, the Georgia Tech Radio Meteor Wind Facility has continued to measure winds in the upper atmosphere at the mesopause level (80 to 100 km altitude) over Atlanta (34° N, 84° W). Of particular interest has been an investigation of "Planetary Waves in the Upper Atmosphere", the subject of a Ph.D. thesis written by M. L. Salby, and of the effects of polar winter stratospheric warming events on the mesopause level winds over Atlanta, the subject of an almost completed Ph.D. thesis by P. M. Dolas. For many years a planetary wave with a two day period has been observed globally by radio meteor wind stations, but an explanation of its origin has previously been lacking. It has now been established that the wave is forced from the atmosphere below. The discovery that polar stratwarms have an appreciable effect on the mesopause level winds at midlatitudes, and that, in fact, these changes in the wind field occur before the polar warmings, has added considerably to our understanding of the dynamics of the upper atmosphere, and bears directly on the problems of ozone formation and transportation.

In conjunction with data gathered by the International Association of Geomagnetism and Aeronomy Global Radio Meteor Wind Studies Project (of which the principal investigator is international coordinator), the Atlanta results have shown that below 85 km the winds are part of a distinct mesospheric circulation, while above, the winds are thermospheric. This emphasizes the need to extend global atmospheric circulation models which include the mesosphere to at least as high as 85 km altitude.
Publications

Open literature:


Reprints will be forwarded as soon as received.

Conference Proceedings:


Theses:


Reports:


Data on Scientific Collaborators

Graduate Students

M. L. Salby
   Ph.D. awarded April 1978

P. M. Dolas
   Ph.D. thesis defence scheduled for December 20, 1978