N89-16662

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
RESEARCH AND TECHNOLOGY RESUME

TITLE

PLANETARY SUBMILLIMETER SPECTROSCOPY

PERFORMING ORGANIZATION

JET PROPULSION LABORATORY
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DESCRIPTION *(a. Brief statement on strategy of investigation; b. Progress and accomplishments of prior year. c. What will be accomplished this year, as well as how and why; and d. Summary bibliography)*

(a) Develop a comprehensive observational and analytical program to study solar system physics and meteorology by measuring molecular lines in the millimeter and submillimeter spectra of planets and comets. A primary objective is to conduct observations with new JPL and Caltech submillimeter receivers at the Caltech Submillimeter Observatory (CSO) on Mauna Kea, Hawaii. A secondary objective is to continue to monitor the time variable planetary phenomena (e.g Jupiter and Uranus) at centimeter wavelengths using the NASA antennas of the Deep Space Network (DSN).

(b) Progress (FY 88): Halley: Paper submitted on H2O Observations from KAO Uranus: Published paper on a geometrical beaming model to account for Uranian kilometric radio emission observed by Voyager.Jupiter: Continued Jupiter Patrol observations at 13-cm; Reported tentative correlation between variations of Jovian synchrotron emission and solar wind ion density. Venus: NRAO & DSN obserations used to set upper limit to H2SO4 in Venus atmosphere (1st draft of paper written).

(c) Prepare observing program for CSO Planetary observations. Continue study of the effect of H2SO4 abundance on Venus microwave spectrum. Conduct new observations of the time variations of the microwave spectra of the atmosphere of Uranus and the magnetosphere of Jupiter using the newly upgraded DSN 70-m antennas. Participate in International Jupiter Watch measurement campaigns. Begin high time resolution measurements of Jupiter with the Hot Creek 26 m antenna.

(d) de Pater & Klein, 1988, Review Paper in Proc. of Workshop on Time Variable Phenomena in Jovian System (Flagstaff AZ) (in press).
Klein, Thompson & Bolton, 1988 in Proceedings of Workshop on Time Variable Phenomena in the Jovian System (Flagstaff AZ) (in press).
Gulkis , 1987 "Radio Astronomy, Planetary". In Encyclop. of Physical Sci. and Tech., 11, Academic Press;
Gulkis and Carr 1987, J. Geophys. Res., 92 (A13).
Gulkis, et al., 1987 (Halley Paper) submitted to Astron. and Astrophys.