2.6 Modelling the Albedo Variation of Saturn from 0.4 to 0.8 μm. J. T. BERGSTRAHL, Jet Propulsion Laboratory - Recent spatially resolved absolute spectrophotometry (Bergstrahl et al., 1979) has made it possible to analyze the detailed albedo variations of Saturn's Equatorial and South Temperate Regions between 0.34 and 0.81 μm. Models based on the Podolak and Danielson (1977) parameterization of the albedo variation of scattering and absorbing "dust" reproduce the detailed spectrophotometric measurements of the South Temperate Region longward of 0.4 μm; the observed albedo upturn in the near-UV (360.37 μm) indicates conservative Rayleigh scattering by more than 28 km-amagat of clear H₂ overlying all aerosol strata. Over the Equatorial Region, more than 14 km amagat of clear H₂ is necessary to reproduce the observed near-UV albedo upturn. More important, however, is the finding that it is not possible to reconcile the observed profiles of the CH₄ bands at 0.619, 0.725, and 0.79 μm in the Equatorial Region, with any combination of free model parameters, if the Podolak - Danielson model of aerosol albedo variation is adhered to. The spectrophotometric observations indicate the presence of another type of scattering/absorbing aerosol in the Equatorial Region.

References:
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2.7 Search for Aerosol on Saturn Using an Eclipse of Titan. D. W. SMITH, U. Wash., P. E. JOHN-SON, JPL, R. W. SHORTHILL, U. Utah Res. Inst., E. BUDING, U. Manchester, and A. S. ASAID, Helwan Obs. - An eclipse of Titan by Saturn was observed on Dec. 21, 1979 in order to measure the aerosol content in the atmosphere of Saturn. The measurements were made with the 74-inch telescope of the Helwan Observatory, Egypt, in the bandpass 6300 - 7300 Å and extend to -4 mag. of eclipse darkening. Implications for the Saturnian aerosol are discussed.

2.8 Interferometric Observations of Saturn at 3.4 Millimeter Wavelength. J. N. CUIZI, Amy Research Center, and W. J. Welch, U.C. Berkeley - We have observed Saturn in May 1980 with the rings nearly edge-on using the Hat Creek Millimeter Interferometer. The antenna spacing (200 feet North-South) was chosen so as to maximize information on planetary limb-darkening, and in particular on polar limb-darkening. An effective resolution of 0.5 arc sec was obtained. Both amplitude and phase data are well-calibrated using the widely observed unresolved radio source 3C273, fortuitously nearby. Inferences as to the form of the limb darkening (or brightening) are presented, as well as implications as to the validity of spatially homogenenous models of the planet in general. The effects of the rings, although small, are also assessed.

2.9 Regions of Weak Methane Absorptions in the Near Infrared: Laboratory Measurements and Planetology Applications. C. de BERGH, Observ. de Meudon, J.P. MAILLARD, Observ. de Meudon and CFHT, Hawaii, J. BRAULT, Kitt Peak Obs., J.C. BURIEZ, Univ. de Lille, B. LUTZ, Lowell Observ., T. OWEN, Stony Brook Univers. - High-resolution spectra of CH₄ have been recorded with interferometers at Meudon and Kitt Peak Observatories in regions of weak absorptions in the near infrared. Room temperature line intensity and line broadening measurements have been obtained for lines near 6400 cm⁻¹, 7900 cm⁻¹ and 9500 cm⁻¹. The same lines have been analysed in an interferometric spectrum of Saturn at 0.2 cm⁻¹ resolution by using these laboratory measurements and, in addition, a previous study of lines with known J-values in the same Saturn spectrum near 9100 cm⁻¹ (J.C. Buriez and C. de Bergh, to be published in Astron. & Astrophys.). The dependence on temperature of the intensities of the lines studied here has been obtained by comparing a synthetic spectrum of Saturn with the observed spectrum. Implications on analyses of Titan and Uranus spectra are discussed. In addition, as some of the very weak CH₄ absorptions near 6400 cm⁻¹ have been identified as CH₃D absorptions, a search for CH₃D absorptions in Saturn, Uranus and Titan spectra has been made.

2.10 Longitudinal Variability of Methane and Ammonia on Saturn. A. L. COCHERAN and W. D. COCHERAN, Univ. of Texas - We have obtained a set of 129 spectra of the equatorial region at the central meridian of Saturn on March 4-6, 1980 UT. The rings were edge on at this time and did not contaminate the spectra. Each spectrum, covering the region from 6000-6600 Å, was obtained in 6 minutes of observation representing 25° of longitude and 35° of latitude. Complete longitudinal coverage of the planet at low airmass was achieved. Comparison spectra of the Moon and spectrophotometric standard stars were also obtained in order to reduce the Saturn spectra to reflectivities. The equivalent widths of the CH₄ 6190 Å and NH₃ 6450 Å bands were measured using a consistent, non-subjective continuum placement scheme. Weak variations of both the methane and ammonia bands are evident and seem to