

HIGH ALTITUDE INTERFEROMETER SPECTRA OF MARS

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Abstract. Spectra of Mars were presented which were taken as part of the LPL high altitude program [1] with the NASA CV990 jet. The spectra were taken at about 40 000' (12 km) altitude. Two sets of five flights each were made around May 1, 1969 and June 1, 1969. In each case the first flight was a Moon comparison flight and the other four were Mars flights, with some Moon if the Moon could be observed.

A 12" telescope received light from a gyroscopically controlled heliostat and directed it into a Block Associates rapid scan interferometer. (For details see Reference [2].) The interferometer had a resolution of 5 cm^{-1} . The present spectra are, however, only reduced for a resolution of 8 cm^{-1} due to limitations in our computer operations.

The spectra taken around June 1 are of better quality since Mars was brighter at that time. The CO_2 bands at 1.4μ , 1.6μ , 2.0μ , and 2.7μ all show up very nicely. The isotopic C^{13} companion band of 003 as well as the ordinary forbidden isotopic band of $\text{O}^{16}\text{C}^{12}\text{O}^{18}$ (002) can be detected. No water vapor at 1.4μ or 1.8μ remains after taking the ratio with the Moon. Some possible trace remains at 2.7μ . Quantitative analysis as well as reductions of the interferograms to higher resolution are in progress.

References

- [1] *Comm. Lunar Planetary Lab.* Nos. 93–96.
- [2] *Comm. Lunar Planetary Lab.* No. 100.