

Abstract Submitted
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Development of a low cost infrared spectrophotometer and a Matlab program to detect terrestrial and extraterrestrial water vapor LAKSHMI RAJU, Alabama School of Fine Arts — The objective of this project was to develop a low cost infrared spectrophotometer to measure terrestrial or extraterrestrial water vapor and to create a Matlab program to analyze the absorption data. Narrow bandwidth infrared filters of 940 nm and 1000 nm were used to differentially detect absorption due to vibrational frequency of water vapor. Light travelling through a collimating tube with varying humidity was allowed to pass through respective filters. The intensity of exiting light was measured using a silicon photodiode connected to a multimeter and a laptop with Matlab program. Absorption measured (decrease in voltage) using the 940nm filter was significantly higher with increasing humidity (p less than 0.05) demonstrating that the instrument can detect and relatively quantify water vapor. A Matlab program was written to comparatively graph absorption data. In conclusion, a novel, low cost infrared spectrophotometer was successfully created to detect water vapor and serves as a prototype to detect water on the moon. This instrument can also assist in teaching and learning spectrophotometry.

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