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## **POS-12 Calculating the Temperature, Pressure, and Humidity Dependencies of the Michelson Interferometer for Airglow Dynamics Imaging (MIADI)**

*Tuesday 12 June 2018 18:25 (2 minutes)*

The Michelson Interferometer for Airglow Dynamics Imaging (MIADI) is a field widened Michelson interferometer which provides images of wind using Doppler shifts in interference fringes from terrestrial airglow emissions. Although it is thermally compensated by using different glasses, some residual temperature dependence remains. Close examination of the interference fringes using a fixed source reveals details about the path difference and its dependence on temperature and pressure. The phase of the interference patterns should remain constant over time in an ideal environment. By monitoring the phase of the interference pattern along with the environmental temperature and pressure the sensitivity of the instrument to temperature, pressure, and humidity can be determined. Several time series of the interferometer phase as a function of vary conditions have been undertaken in our lab at the University of New Brunswick. Multiple regression analyses of the dependencies of phase on environmental conditions were calculated. In this paper, an overview of the process to determine the temperature, pressure, and humidity dependencies of the Michelson Interferometer for Airglow Dynamics Imaging (MIADI) and their implications are presented. Since the observed dependencies do not match theoretical expectations determining the different environmental dependencies will allow for corrections to be made in the design of new wind imaging instruments.

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