2017 Workshop: Optical calibration and analysis

Long title
Calibration and analysis techniques for passive optical observations
Conveners
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Description

Accurate calibration is important for inter-comparison of observations, data/model comparisons, and long-term investigations. We invite discussion on a broad range of topics relating to passive optical and lidar observations and their analysis. Possible topics include absolute and relative intensity calibration, wavelength calibration, spatial scale determination, error analysis, correction for scattering within the lower atmosphere, isolation of atmospheric lines of interest, flat field techniques, spectral fitting approaches, and analysis of long term data sets. In addition to reporting progress on calibration and analysis techniques, this workshop provides an opportunity to discuss challenges and gain feedback from other workshop participants. We encourage hands-on demonstrations. In addition, we welcome modelers to discuss use of observations for model-data comparisons, and associated questions and challenges for model validation. We welcome and encourage presentations by students.

Agenda

Presentations include:

Harald Fray – Calibration and Testing of Wide Field UV Instruments (announcement)

John Noto – Comparison of FPI wind measurements from Millstone Hill and Trivandrum, India

Marty Mlynczak – Calibration and trend analysis

Maggie Gallant– A Remote Observatory for Geocoronal Balmer Series Observations and Beyond

Bruce Fritz – Calibration and analysis of a rocket borne UV PMT in the cusp

Mark Conde - update on triangulation for rocket studies

Tropospheric Scattering:

Jeff Baumgardner – Tropospheric Scattering

Brian Harding - Tropospheric Scattering: Models and Corrections

Susan Nossal – Tropospheric Scattering Contribution to Geocoronal Hydrogen emission observations

Justification

Accurate calibration, analysis, and error assessment provides the foundation for data that can be used to address a range of CEDAR strategic science topics, including coupling in the interaction region between the Earth's atmosphere and the near space environment, lower-upper atmospheric coupling, Sun-Earth interactions, investigation of atmospheric dynamics through combination of observations such as wind measurements, and long-term climatology observations.

Summary

This is where the final summary workshop report will be. Accurate calibration is important for inter-comparison of observations, data/model comparisons, data assimilation, and long term-term investigations. The Optical Calibration and Data Analysis workshop provides a forum for participants to present calibration and data analysis techniques, provide updates on optical observations, and discuss challenges. As has been the case in previous years, there was student and post doc involvement both as speakers and participants. About thirty people participated in the 2017 workshop and about a third of both the participants and speakers were students and postdocs. The workshop included much time for informal discussion and questions.

A theme of this year's workshop was tropospheric scattering. Extinction of light along the line of sight within the troposphere due to absorption and scattering can be accounted for by measuring the extinction coefficient using observations of a source (such as an astronomical nebula) taken at different zenith angles. However, it is more difficult to account for the portion of the signal due to scattering into the line of sight within the troposphere and tropospheric scattering is a major source of

uncertainty in optical observations. There were several presentations and associated discussion about this topic during the workshop. There were also presentations and discussions on a range of other topics including calibration of instruments measuring ultraviolet emissions; comparison of Fabry-Perot wind observations from Millstone Hill, MA and Trivandrum, India; trend analysis; building a remote observatory; and triangulation for determining spatial location. A list of presentations is below.

- Harold Frey - Calibration and Testing of Wide-Field UV instruments (announcement) - John Noto – Comparison of FPI wind measurements from Millstone Hill and Trivandrum, India - Marty Mlynczak – Calibration and trend analysis - Maggie Gallant– A Remote Observatory for Geocoronal Balmer Series Observations and Beyond - Bruce Fritz – Calibration and analysis of a rocket borne UV PMT in the cusp - Mark Conde– Update on triangulation for rocket studies - Jeff Baumgardner – Tropospheric Scattering - Brian Harding - Tropospheric Scattering: Models and Corrections - Susan Nossal – Tropospheric Scattering Contribution to Geocoronal Hydrogen emission observations

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