Diel and Diurnal Observations of Wildfires Boundary Layer Dynamics and Aerosol Plume Convection using Stereo-Imaging Techniques

BG1.1 Fire in the Earth System: Interactions with Land, Atmosphere and Society
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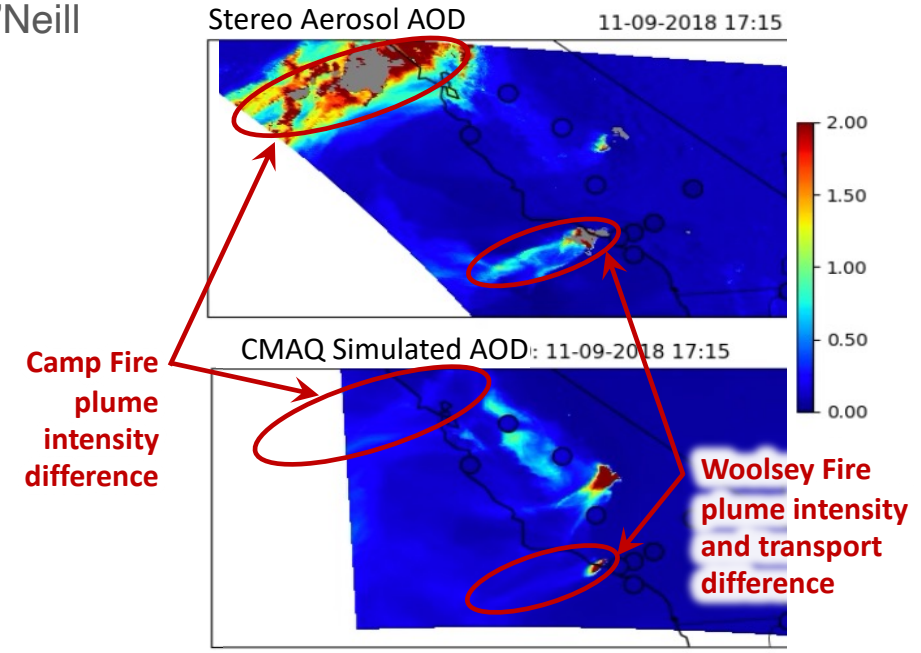
- **Motivation:** Wildfire plume height observations are critical to assessing wildfire impacts but remain sparse and lack the spatiotemporal coverage and accuracy needed by models.
- **Objectives:** Increase wildfire weather dynamics observations by applying our LEO-GEO and GEO-GEO Stereo-Imaging Techniques by:
  - Leveraging NASA's LEO and NOAA's GEO
  - Increase assignment accuracy of model using stereo
    - Plume injection time and top height
    - Plume wind speeds and directions
    - aerosol loadings, composition, and transport
  - ***Diurnal coverage of GEO-GEO stereo products*** support improvements of
    - Sub-hourly numerical weather and chemical transport simulations needed to capture intense fire dynamics
    - data assimilation inputs into numerical prediction systems at the sub-hourly frequency
    - Furthering our understanding of intense wildfire dynamics and PBL variations such as pyroCB
  - Comparison between stereo-imaging remote sensing products and model simulations highlight how important the stereo observations are for aerosol transport and illustrate how hourly simulations may not be enough to capture intense fire dynamics.

California Camp & Woolsey Fires (Nov 2018)



California Creek Fire Diel Plume Heights (Sep 2020)