MFRSR Column Intensive Properties VAP Development: Motivation and Objectives

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Aerosol Life Cycle *support*

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Motivation

- AERONET provides **valuable** data
- **Limited** availability of AERONET aerosol **intensive** properties (**level 2**)

  SGP (**1996-2010**): **71** ~ **4.7** days/year

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MFRSR: Clear-Sky Applications

- **Extensive Properties (AOD, …)**

  Michalsky, Alexandrov, …

- **Intensive Properties (SSA, …)**

  UV: Corr, Goering, Taylor, …

  VIS_IR: Kassianov et al.

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Complementary Info

Real Refractive Index	Climatology
Surface Albedo	ARM Product
Sky Cover	ARM Product

MFRSR(VIS_IR): Output

Imaginary Refractive Index

Size Distribution (Two Modes)

Intensive Optical Properties (SSA, g, …)

MFRSR VAP: Objective (1)

- Develop a tool for **operational** retrievals of aerosol **intensive** aerosol properties (**clear-sky**)
- Evaluate it using **available** **multi-year** data (e.g., AERONET, HSRL,…)

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MFRSR VAP: Objective (2)

- Develop a tool for **operational** retrievals of aerosol **intensive** aerosol properties (**partly cloudy-sky**)
- Incorporate **available** MFRSR-based retrievals of **cloud** properties (e.g., Min et al., …)

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MFRSR/SAS VAP: Objective (3)

- Develop a next generation of retrievals for SAS with extended spectral coverage/resolution.
- Address Objectives 1&2 (clear-and cloudy-sky applications) using SAS.
- Incorporate gas phase retrieval (Water vapor, O_3, N_2O,…)

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Summary: MFRSR/SAS Data

- Give opportunity to provide important **aerosol** and **cloud** properties concurrently
- These properties are valuable for **Aerosol LC**, **Cloud LC** and **CAPI**:
  - *Aerosol: AOD, SSA, g, Size, n, gases,*
  - *Cloud: COD, Reff, Cloud Fraction, LWP,*
  - *Clear-Sky, Partly Cloudy-Sky*

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