# AeroSat

## International Satellite Aerosol Science Network

## Third Meeting

## Frascati, October 8-9, 2015

## *Outcomes*

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# AeroSat-3 (2015) *Major Themes*

- ***Satellite-Model*** **Interaction**
- **Constraining *Aerosol Type* with satellite data**
- **Combining *Multiple Data Sources* with models**
- **Deriving *Pixel-level Uncertainties***
- **Producing *Long-term* satellite data records**

# AeroSat-3 (2015) *Major Themes*

- ***Satellite-Model*** **Interaction**

  -- ***Dust retrieval*** comparisons – include 10 micron data
  -- More satellite-model ***AOD comparisons*** needed
  -- Need to compare ***retrieval & model assumptions***
  -- Need better harmony between ***satellite simulators*** & data
  -- ***Constraining MIPs*** – use data for present,
  inform past & future
  -- Need to highlight ***limitations of AERONET inversion*** data
  -- Need to make better use of ***Aerosol Precursor*** data
  -- User desire – ***consistent satellite data*** products
  -- User desire – ***CCN proxy***, including vertical distribution
  -- user desire – ***Pixel-level*** uncertainty

# AeroSat-3 (2015) *Major Themes*

- **Constraining *Aerosol Type* with satellite data**
  - -- ESA's CCI project is working on ***Product Harmonization***
  - -- Recognize ***Two Approaches***, in some cases two ***steps***:
    retrieved optical properties & interpretive types
  - -- Advantages of integrating data from ***Multiple Sources***
  - -- Need for much more ***Validation Data***

# AeroSat-3 (2015) *Major Themes*

- **Combining *Multiple Data Sources* with models**

-- Could ***aerosol & cloud data*** be combined in transition zone?

-- Combine ***MODIS and CALIPSO*** data into large data record?

-- Can ***TRMM-like precipitation method*** be used for aerosols?

-- ***Data Assimilation*** is one way to combine data

# AeroSat-3 (2015) *Major Themes*

- **Deriving *Pixel-level Uncertainties***

  -- Required for ***Aerosol Data Assimilation***
  -- Top-down ***Validation*** & bottom-up ***Uncertainty Propagation*** are complementary approaches
  -- Reported uncertainties themselves need to be ***Validated***
  -- Possible use of ***Satellite + Model*** to assess uncertainties

# AeroSat-3 (2015) *Major Themes*

- **Producing *Long-term* satellite data records**

  -- ***MeteoSat*** has data back to 1982
  -- ***AVHRR*** has data back to 1979 (16 satellites)
  -- Instrument ***time-series overlap*** required for cross-cal.
  -- Early ***Validation*** difficult – use available ground-based obs.
  -- Pre-AERONET validation ideas: solar dimming/brightening ***pyranometers***; ***MFRSR***, observatory ***solar irradiance*** obs.

# AeroSat *GOALS for this Meeting*

- Encourage ***greater participation*** from Asian scientists
  - -- ***Learn*** about capabilities and interests
  - -- Identify possible ***areas of coordination*** & collaboration
- Characterizing Satellite ***retrieval-result uncertainties***
  - -- ***Modeling needs***, especially assimilation
  - -- ***Possible approaches*** & their limitations
- Challenges & Possibilities for contributing to ***air quality*** studies
  - -- Deriving ***near-surface component***, ***speciation***
  - -- Obtaining adequate ***spatial & temporal resolution***
- Progress on ***constraining and using aerosol type***
- Issues & advances in deriving ***consistent long-term satellite climate data records***
- ***Satellite retrieval - modeler interaction***