Session 13
Aerosol typing

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Seed talk:
Lucia Mona / CNR: aerosol type inventory (update)

Aerosol Typing
## *Main Points 2015*

- ➤ Recognize *Two Approaches*, in some cases two *steps*:
    - ➤ retrieved optical properties & interpretive types
    - ➤ information content differs between sensors
    - ➤ Information content is function of environmental & aerosol conditions

- ➤ Advantages of integrating data from *Multiple Sources*

- ➤ Need for much more *Validation Data*

- ➤ **Inventory** to get overview of different concepts
    - ➤ Hierarchical structure / not invest too much into detail

- ➤ Need to consider **different usage** with possibly different requirements
    - ➤ model validation
    - ➤ data assimilation
    - ➤ policy support / public communication

Properties which can be retrieved

➢ Spectrally-dependant AOD
  ➢ Size estimate (effective radius, fine / coarse mode AOD, Angström coeff.)

➢ Fraction of AOD by non-spherical particles
➢ Mineral dust AOD (thermal IR)
➢ Degree of depolarisation (lidar)

➢ Single scattering albedo (UV)

➢ (average / effective) layer / plume height (stereo, IASI)

Number of components 2015 inventory
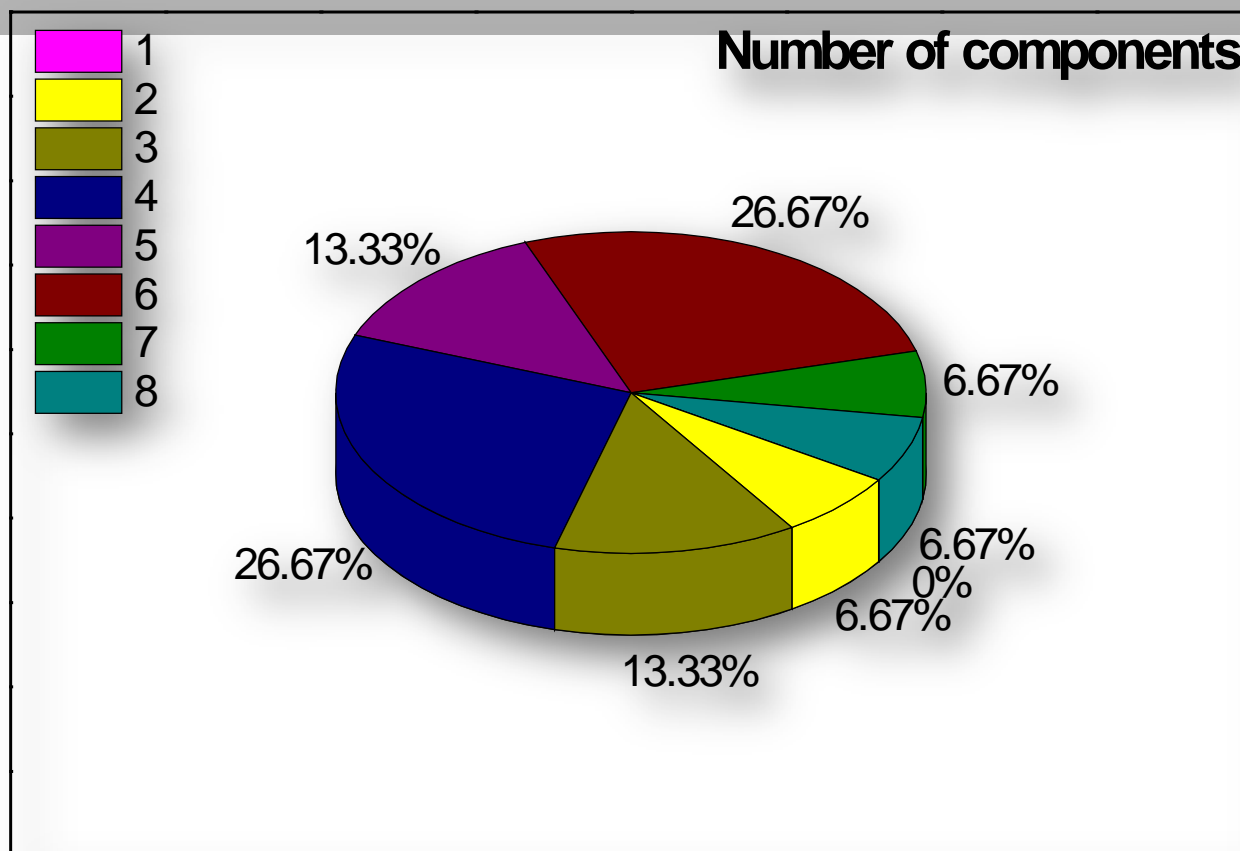
Even if different the aerosol typing procedures typically classify aerosol in 4-6 types. Never exceeding 8 components.

The nomenclature is very heterogeneous among different platforms.

6 main classes could be identified grouping the different nomenclatures.

A proposal for basic components (interpretive schemes)

A set of 6 pure aerosol components + their mixtures

A first proposal could be:

Mineral dust

Biomass burning

Marine

Urban/industrial

Volcanic ash

Sulfates

(or equivalent names).

Seed questions

• is it possible to find translation rules between the two nomenclature approaches (physical observables vs **interpretive composition**)?

• can the inventory help to harmonize the mapping of retrieved properties and interpretive composition?

• how can we benefit from integrating multiple sources?

• how can we validate aerosol type information and their uncertainties?

• which (new) validation data for aerosol type information do we need?