Atmospheric Composition Observation System Simulation Experiment (OSSE) Workshop

Supported by CEOS Atmospheric Composition Constellation

ECMWF, Reading UK, October 2012

Organizers: Vincent-Henri Peuch (ECMWF), David Edwards (NCAR), ???? (Asia)

Part 1: Theoretical Context – Day 1 PM

- Review theoretical basis of OSSEs
- What is the experience of the meteorological NWP community
- What makes a good OSSE?
- Problems, limitations and pitfalls
- How are chemical and meteorological OSSEs different, and might they be of greater value for composition?

Part 2: Review of progress – Day 2 AM

- What chemical OSSEs have been performed to-date?
- Experience and results
    - POGEQA/MAGEAQ (CO, O3)
    - GEO-CAPE (NCAR (CO), Harvard (O3), JPL?)
    - TNO (aerosols)
    - ISOTROP (ESA funded)
    - Others? Asia?

Part 3: OSSE Infrastructure 1 – Day 2 PM, split into groups

1. **Developing the Nature and Control Runs**
    - Choice of model(s)/hindcast(s)/analyses
    - Validating against field campaigns
    - Twins scenarios, independence from Nature Run, and acceptable degree of difference
    - Perturbed parameters: initial conditions, meteorology, emissions…
2. **Measurement Simulators**
    - Forward model development
    - Scene-dependent measurement simulations
    - Viewing geometry issues
    - Including clouds
    - links with efforts at space agencies or large space companies to develop realistic instrument models (ESA, NASA, CNES…)
3. **Assimilation approaches**

- Sequential/ensembles/variational
- Progress toward radiance assimilation

Part 4: OSSE Infrastructure 2 – Day 3 AM

- Report back from Infrastructure Groups
- General discussion

Part 4: Experimental Design – Day 3 PM

- Case 1: Compare GEO AQ instruments
- Case 2: Impact of CEOS constellation including LEOs
- Shared resources: Tools and people

Invitees:

- Invited core group
- Representation from ECMWF MACC, NOAA, NASA GMAO, Asian agencies