

5.020 Towards an ECMWF's CAMS near real-time global surface flux inversions..

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Abstract:

The European Union's Copernicus Atmosphere Monitoring Service (CAMS) operationally provides daily forecasts of global atmospheric composition and regional air quality. It uses the ECMWF Integrated Forecasting System (IFS), that includes meteorological and atmospheric composition variables, such as reactive gases, greenhouse gases and aerosols. There is a strong need to monitor surface fluxes in addition to the 3D representation of atmospheric composition. In this presentation, we will show plans and advances on implementation of the surface flux inversion suite to provide real-time surface flux updates jointly with the current atmospheric updates (i.e. tracers and NWP variables), given constraints on the IFS and the observation stream available.

Firstly, we will emphasize the efforts to update the CAMS system to an Ensemble of Data Assimilation (EDA), i.e. running an ensemble of 4D variational analysis updates and subsequent forecasts. We will show how the ensemble information in a variational framework can be used to infer surface fluxes and potentially provide sectoral inversion. Additionally, we will compare the benefits and deficiencies of the ensemble formulation with the adjoint formulation for this particular application within the IFS.