Metview and VAPOR: Exploring ECMWF forecasts easily in four dimensions

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The European Centre for Medium-Range Weather Forecasts (ECMWF) is an international organisation providing its member states and co-operating states with forecasts in the medium time range of up to 15 days as well as other forcasts and analysis. As part of its mission, ECMWF generates an increasing number of forecast data products for its users. To support the work of forecasters and researchers and to let them make best use of ECMWF forecasts, the Centre also provides tools and interfaces to visualise their products. This allows users to make use of and explore forecasts without having to transfer large amounts of raw data. This is especially true for products based on ECMWF's 50 member ensemble forecast. Users can choose to explore ECMWF's forecasts from the web or through visualisation tools installed locally or at ECMWF.

ECMWF also develops in co-operation with INPE, Brazil, the Metview meteorological workstation and batch system. Metview enables users to easily analyse and visualise forecasts, and is routinely used by scientists and forecasters at ECMWF and other institutions. While Metview offers high quality visualisation in two-dimensional plots and animations, it uses external tools to visualise data in four dimensions.

VAPOR is the Visualization and Analysis Platform for Ocean, Atmosphere, and Solar Researchers. VAPOR provides an interactive 3D visualisation environment that runs on most UNIX and Windows systems equipped with modern 3D graphics cards. VAPOR development is led by the National Center for Atmospheric Research's Scientific Computing Division in collaboration with U.C. Davis and Ohio State University.

In this paper we will give an overview of how users, with Metview and access to ECMWF's archive, can visualise forecast data in four dimensions within VAPOR. The process of preparing the data in Metview is the key step and described in detail. The benefits to researchers are highlighted with a case study analysing a given weather scenario.