

## **A ten-year experiment of real-time Potential Vorticity modifications and inversions at Météo-France**

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It appears that some short-range weather forecast failures may be attributed to initial conditions errors. In some cases it is possible to anticipate the behavior of the model by comparison between satellite imagery with the model analysis (its Potential Vorticity (PV) or simulated satellite pictures). In the case of extratropical cyclone development one may qualify the representation of the upper-level precursors described in terms of PV in the initial conditions by comparison with either satellite ozone or water-vapor. A step forward has been made in developing a tool based upon manual modifications of dynamical tropopause (i.e. height of 1.5 PV units) and PV inversion. Conclusions from a ten year experimentation will be drawn. In particular, it turns out that the forecasters eventually succeed in improving the forecast of some strong cyclone development. However the present approach is subjective per se. To measure the subjectivity of the procedure a set of 15 experiments has been performed provided by 7 different senior forecasters and scientists in order to improve an initial state of the global model ARPEGE leading to a poor forecast of the wind storm Klaus (24 January 2009). This experiment reveals that the manually defined corrections present common features and significantly lead to forecast improvement.