The Concordiasi Campaign over Antarctica: Inter-model Monitoring and Impact on the Assimilation.

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The Concordiasi project is a multi-annual field campaign over Antarctica. The main goal is to provide validation data to improve the usage of polar-orbiting satellite data over Antarctica, in particular IASI radiances. The other areas of interest are the fine scale meteorological and climatic studies of the Antarctic plateau, the study of the influence of better polar area predictions over lower latitudes and over the ozone simulation, together with the monitoring of the polar vortex at the end of winter, thanks to additional stratospheric measurements [1]. In particular, the austral spring-summer 2010 campaign deployed CNES superpressure balloons, most of which were fitted with NCAR dropsounding facility, in addition to LMD in-situ measurement in the gondola.

As the data were distributed in near real time on the GTS, many Numerical Weather Prediction Centres assimilated them in their operational global models. A first part of this paper will describe the compared monitoring of the field campaign measurements between the centres. Some common features highlight some common biases in the models, among other conclusions.

A second part of this paper deals with impact studies. First, using data denial experiment, the direct impact of the special measurements of the campaign is evaluated in a specifically-tuned global model ARPEGE. Then forecast sensitivity to observations (FSO) have been computed at different centres. The FSO results will then be compared with data denial experiment results.

As a conclusion, the outcomes presented in this paper will provide us with some assessment of model quality and with conclusions on the data impact, through the assimilation, over Antarctica.

References

[1]The Concordiasi Field Experiment over Antarctica: First Results from Innovative Atmospheric Measurements (March 2013). F. Rabier, S. Cohn, P. Cocquerez, A. Hertzog, L. Avallone, T. Deshler, J. Haase, T. Hock, A. Doerenbecher, J. Wang, V. Guidard, J.-N. Thépaut, R. Langland, A. Tangborn, G. Balsamo, E. Brun, D. Parsons, J. Bordereau, C. Cardinali, F. Danis, J.-P. Escarnot, N. Fourrié, R. Gelaro, C. Genthon, K. Ide, L. Kalnajs, C. Martin, L.-F. Meunier, J.-M. Nicot, T. Perttula, N. Potts, P. Ragazzo, D. Richardson, S. Sosa-Sesma, and A. Vargas. Bulletin of the American Meteorological Society, Vol. 94, No. 3: ES17-ES20.