

PRESS RELEASE

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Observations improve computer predictions

Weather predictions would be much less reliable if the models that compute them were not corrected by observations. Such use of observations to enhance the accuracy of computer forecasts is called data-assimilation. It is very powerful, but until now also rather expensive. The new OpenDA (Open Data-Assimilation) software brings data-assimilation into the reach of a far greater number of users by allowing it to be implemented for any computer model without the need for a large investment. For certain applications, this may improve the accuracy of model predictions by more than a factor of two. But OpenDA is also useful in fields that already use data-assimilation as it greatly facilitates the adoption of new techniques and improved implementations of algorithms. The OpenDA software has been developed by Delft University of Technology, research centre Deltares and the scientific engineering firm VORtech, all in the Netherlands. As of 10 May, 2010, it will be available as Open Source.

Better predictions at a bargain

Data-assimilation pulls the computer model results close to the available observations. Thus, the model better matches the actual situation and consequently gives better predictions than without data-assimilation.

Developing data-assimilation functionality for a model is the work of specialists. It requires a significant effort and therefore a major investment. That is why these techniques are not applied as often as could be although they could give significant benefits for many applications. Also, in application fields that do use data-assimilation new developments tend to take a long time before being implemented, simply because the cost of implementation is too high. Another factor that hampers the use of data-assimilation is that data-assimilation software is often very complex. Errors are easily made in implementing the software and then the results are disappointing or downright wrong.

OpenDA solves these problems of development time, investment and complexity by offering a set of building blocks that allow the implementation data-assimilation for an arbitrary model with relatively little effort. The building blocks can be reused again and again and are tested with each new application. Therefore, over time they will be largely error-free. On top of that, the building blocks are optimized for high performance computing. That is important because data-assimilation tends to involve a large number of computations.

Experiences with OpenDA

The first beta versions of OpenDA have already been applied in the past few years. The Dutch research institute TNO has connected her Lotos-Euros air quality model to OpenDA and has done experiments to determine which data-assimilation method performs best for this particular application. Also, a consortium of BMT-ARGOSS, the Dutch meteorological institute KNMI and VORtech uses OpenDA for monitoring the air quality over the North sea. This application uses the French air chemistry model CHIMERE and combines it with satellite observations through OpenDA. In a third project, the Dutch government agency for water management, Rijkswaterstaat, implemented OpenDA in the models that operationally predict the

water levels along the Dutch coast. Finally, research centre Deltares already makes extensive use of OpenDA, for example in its Flood Early Warning System (FEWS), for the calibration of the SWAN wave model and for integrating satellite observations into water level models for South-East Asia. Institutes from Belgium, Denmark and the US have shown interest in OpenDA.

OpenDA live

The OpenDA software will be publicly released on a conference at Deltares in Delft, the Netherlands, that brings together experts in the field of surface water modeling from all over the world from 10 until 12 May 2010. The experience that Deltares has gained in the field of data-assimilation for surface water models makes this an excellent forum to present the new software.

Note to the redaction:

For more information, please contact Deltares' press department, tel. +31(0)88 335 84 01

The web site for OpenDA is www.openda.org. A special section for press documentation will be available as of 24 April 2010.