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## Worldwide ozone distribution by using Grid infrastructure

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Satellite data processing presents a challenge for any computer resources due to the large volume of data and number of files. The vast amount of data sets and databases are all distributed among different countries and organizations. The investigation of such data is limited to some sub-sets. As a matter of fact, all those data cannot be explored completely due on one hand to the limitation in local computer and storage power, and on the other hand to the lack of tools adapted to handle, control and analyse efficiently so large sets of data.

In order to check the capability of a Grid infrastructure to fill those requirements, an application based on ozone measurements was designed to be ported first on DataGrid, then on EGEE and local Grid in ESRIN.

The satellite data are provided by the experiment, GOME aboard the satellite ERS. From the ozone vertical total content, ozone profiles have been retrieved by using two different algorithm schemas, one is based on an inversion protocol (KNMI), the other on a neural network approach (UTV). The porting on DataGrid was successful however some functionalities are missing to make the application operational. In EGEE, the reliability of the infrastructure has been as reliable as a local Grid.

The second part of the application has been the validation of those satellite ozone profiles by profiles measured by ground-based lidars. The goal was to find out collocated observations meta databases were built to solve this problem. The result has been the production of the 7 years of data on EGEE and on local Grid at ESRIN with two versions of the Neural Network algorithm and several months by the inversion algorithm. It is an amount of around 100 000 files registered on EGEE.

Then, the validation of this set of data was carried out by using all the lidar profiles available in the NDSC databases (Network Detection of Stratospheric Changes). To find collocation data an OGSA-DAI metadata server has been implemented and geospatial queries permit to search the orbit passing over the lidar site.

The second work, started during DataGrid, has been the development of a portal, specific to the Ozone application, described above, and extended latter to other satellite data like Meris... The role of this portal is to provide an operational way to a friendly end-use of Grid infrastructure. It provides the missing functionalities of the Grid infrastructure.

EGEE offers the possibility to store all the ozone data obtained by satellite experiment (GOME, GOMOS, MIPAS...) as well as ground-based network of lidars and radiosoundings... The next goal on the way is to be able to find out at a given

location and/or at a given time the distribution of ozone by combining all the existing databases.

In this presentation, the scientific and operational interest will be pointed out.

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