

# Project DEGREE: Bringing Grid into the Earth Science

Monique Petitdidier<sup>1</sup>, Ladislav Hluchý<sup>2</sup>, and Miroslav Dobrucky<sup>2</sup>

<sup>1</sup> Centre National de la Recherche Scientifique, Paris, F,  
monique.petitdidier@cetp.ipsl.fr,

<sup>2</sup> Ústav informatiky, Slovenská akadémia vied, Bratislava, SK,  
[hluchy,dobrucky].ui@savba.sk,  
<http://www.eu-degree.eu/>

**Abstract.** Earth Science (ES) community have a big potential to exploit nowadays grid infrastructures like EGEE due to their heavy computational simulations. Several members of ES community created a project called DEGREE (Dissemination and Exploitation of GRids in Earth science) which tries to help other ES application developers and users with using such infrastructures. DEGREE also seeks to address the barriers which stand in the way of a wider uptake of the technology, such as perceived complexity of the middleware, insufficient support for important ES functions and vital additional services. The results will provide feedback to the GRID community and dissemination in the ES community will increase awareness of and involvement with GRID developments.

This paper brings an overview of the DEGREE project and its objectives. Other environmental applications can benefit from the roadmap, one of the DEGREE project results.

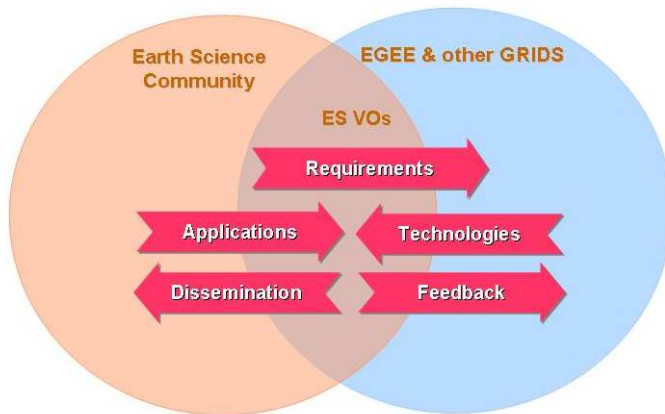
## 1 Introduction

DEGREE [1] is a Specific Support Action (SSA) project which aims to promote GRID throughout large and diverse Earth Science (ES) community, in order to increase the awareness and uptake of GRID technology and infrastructure by EU Earth Science Industry and Research communities. It aims to do this by developing ES approaches and solutions for using the GRID technology and driving home convincing arguments on the potential benefits for large scale ES processing, e-collaboration and research. Although several Earth Science applications have been ported to run on GRID infrastructures since 2000 ([4], [5], [6], [7], [8], [9]), the experiences gained so far have shown that GRID is a developing technology and the Earth Science community is reluctant to deploy their applications on it. DEGREE seeks to address the barriers which stand in the way of a wider uptake of the technology, such as increasing the ES GRID awareness and expertise, perceived complexity of the middleware, insufficient support for important ES functions and vital additional services.

## 2 Challenges and objectives

A major challenge for DEGREE is to build a bridge linking the ES and GRID communities throughout Europe, and focusing in particular on the EGEE-II Project [2]. An ES applications panel with a range of candidate applications suitable for porting to GRID will make sure key ES requirements for porting and deployment on the GRID middleware are identified, communicated and discussed within the GRID community. Other DEGREE work packages are dedicated to exploring and advancement of specific aspects of ES applications GRID interfacing, such as Data Management, Workflow & Job Control and Web Portals. At the same time, the DEGREE SSA will ensure the ES community is informed and up to date on GRID developments and potential benefits.

The results will provide feedback to the GRID community (see Fig. 1), while dissemination in the ES community will increase awareness, expertise and involvement with GRID technology and ongoing development efforts.



**Fig. 1.** DEGREE project objectives

In order to ensure that ES requirements are taken into account in the next Grid generation, DEGREE will initiate different collaborations; at short, medium and long term. Besides establishing close links with the EGEE-II, it will act via horizontal collaborations with other relevant EU projects, specific collaborations with Grid projects and participation to the e-Infrastructure Reflection Group (e-IRG) [3].

DEGREE project objectives:

- Disseminate, promote uptake of Grid in wider ES community
- Reduce the gap between ES users and Grid Technology

- Explain and convince ES users of Grid benefits and capability to tackle new and complex problems

DEGREE project partners:

Ústav informatiky Slovenská akadémia vied (**SK**), Centre National de la Recherche Scientifique (**FR**), Koninklijk Nederlands Meteorologisch Instituut (**NL**), Universit de Neuchtel (**CH**), Centro di Ricerca, Sviluppo e Studi Superiori in Sardegna Societa' a responsabilita limitata (**IT**), European Space Agency (**INT**), Compagnie Gnrale de Gophysique (**FR**), Dutch Space BV (**NL**), Fraunhofer Gesellschaft zur Foerderung der angewandten Forschung E.V. (**DE**), Geophysical Center, Russian Academy of Sciences (**RU**).

### 3 Acknowledgements

This work is supported by European project DEGREE FP6-034619, and by Slovak project VEGA No.2/6103/6.

### References

1. DEGREE project [www.eu-degree.eu](http://www.eu-degree.eu)
2. EGEE-II project [www.eu-egee.org](http://www.eu-egee.org)
3. e-Infrastructure Reflection Group [www.e-irg.org](http://www.e-irg.org)
4. Šimo B., Ciglan M., Slížik P., Mališka M., Dobrucký M.: Mediterranean Grid of Multi-Risk Data and Models. In: Proc. of 1-st workshop Grid Computing for Complex Problems - GCCP 2005, VEDA, (2006) 129–134
5. Hluchý L., Habala O., Šimo B., Astaloš J., Tran V.D., Dobrucký M.: Problem-solving environment for flood forecasting. *Management of Environmental Quality: An International Journal*, Vol 15, No.3 (2004) 268–275
6. Fusco L., J.Linford, W. Som de Cerff, C. Boonne, C. Leroy, M. Petitdidier: Deployment of Earth Observation Applications on the European DataGrid Testbed. Global Grid Forum 10, The Future of Data Grid Environments Workshop, 2004, Berlin
7. Godin-Beekmann S., C. Boonne, C. Leroy, M. Petitdidier: Validation des profils d'ozone drivs des mesures Gome avec DataGrid, Proceedings of Atelier Experimentation et Instrumentation, Paris, France, 23-24 Mars 2004.
8. D Thomas, M. Petitdidier, EGEODE: a Grid Infrastructure for Research in Geosciences, EAGE, Madrid, Spain, June 2005.
9. Casadio, S., K. Franzens, D. Del Frate, S. Godin-Beekmann, and M. Petitdidier: Grid Technology for the analysis of atmospheric ozone from satellite data. Proceedings of Data Systems In Aerospace (Dasia), Prague, Tchquie, 2-6 June 2003.