



## **The PRISM Standard Compile and Runtime Environments**

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PRISM (EU FP5 Project for Integrated Earth System Modelling) has had as a major objective the establishment of a common infrastructure for the European Earth System modelling community. Since the end of the project in November 2004, the software is maintained and further developed by the PRISM Support Initiative (PSI), a multi-institute distributed network of experts from European research centres.

Because of the large number of models and platforms used within the European Earth System (ES) modelling community, the PRISM software includes an infrastructure for the compilation and execution of ES models, the Standard Compiling and Running Environments (SCE/SRE). Taking into consideration the quick development of both software and hardware, the SCE and SRE are designed in a way to allow an easy extension of the infrastructure to accommodate new models and platforms.

One aspect of the standard environments is a well defined Unix directory tree for component models (including the coupler), libraries, compiler output and the script code, from which compile and run time tools are generated.

Organizing the component model source codes according to the rules of the SCE, gives a common look&feel with all models and enables the use of relatively simple utilities. The PRISM software does not contain ready-to-use scripts, but provides a comprehensive set of utilities to generate standardized scripts specific to the combination of component models participating in the coupled model and to the platform the model is intended to run on. Scripts are assembled from a data base of small files, containing script code fragments. These fragments are specific for a component model or a platform or both, or they are used for all models on all platforms. Scripts assembled in that way from case to case do not contain unused or redundant code, and the method allows for easy adaptation to new coupled models or new platforms since model, operating

system, and site dependent code is clearly identified.

The scripts generated within the SCE and SRE (i.e. scripts for model compilation, integration, data pre- or post-processing, visualization, and archiving of output data) give a common look&feel for every model adapted to the PRISM infrastructure. This minimizes the effort to set up and run coupled model experiments, helps to design and run new coupled models, and facilitates porting activities to new platforms. Cooperation between different centres and scientists is thereby supported.

Adaptation of component models to the PRISM software and standards is supported directly by the PSI team, through extensive documentation of the software and infrastructure as well as by the provision of tools. Once a model is integrated in the PRISM system it profits from future updates of the system.

Several EU and other projects (e.g. ENSEMBLES, GEMS, COSMOS) exploit the use of the PRISM infrastructure including the SCE and SRE for their activities.