

A Proposal to Standardize Models

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During the last ten to twenty years, the number of atmospheric models has proliferated and now involves a wide range of separate investigating teams. Unfortunately, however, although the mathematical and physical framework of many of the subroutines that are used to construct these models are similar, there has been no initiative to standardize the computer logic which links these subroutines with the mainframe of a model. These subroutines (i.e., modules) include such components of a program as the cumulus parameterization scheme, the planetary boundary layer representation, the lateral boundary conditions, etc.

When only one investigating group uses a model, there is no need to standardize these modules. If, on the other hand, a researcher would like to utilize a module from someone else's code (e.g., their boundary layer parameterization), scientific productivity would be greatly facilitated if the borrowed module could be simply "plugged into" an existing code. In addition, researchers who specialize in one specific area of relevance to modeling could develop a module (i.e., a parameterization) that has a standardized interface so it could be used with relatively little effort by other investigators in their atmospheric models.

This standardization of software, of course, is common practice in the microcomputer arena, but it has not been adopted in our field. This approach would be most easily implemented in those existing codes which have a skeletal mainframe driver to the model which calls the modules as subroutines. Current codes which are mainly in-line (i.e., without modular subroutines) would require much more effort to standardize.

We would like to ascertain if there is interest in the community to design a framework for standardized codes. If so, a meeting (perhaps as part of an existing AMS Conference) could provide the forum to introduce such a standard. We feel that such a standardization will optimize the testing of models and the exchange of scientific ideas. Among the problems associated with standardization that need to be addressed are the tradeoffs between model efficiency (which can be machine dependent) and portability of a code between different computing systems (e.g., the CRAY and CDC 205), as well as the recent proliferation of non-ANSI/ Fortran 77 software. ●