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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Technical Note: The Modular Earth Submodel System (MESSy) – a new approach towards Earth System Modeling" *by* P. Jöckel et al.

Anonymous Referee #1

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Review:

The authors present a new interface for use in coupled systems, like Earth System Models. A detailed description is presented and the authors explain clearly why they have have chosen this approach and what advantages it have. The paper is acceptable after minor revisions, which mainly deal with clarifications. My main comment concerns the abstract and conclusion, which should more clearly describe the system's specifications and compare it to alternatives (see below).

General comments:

- Abstract has to be clarified:

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State more clearly that MESSy is an interface, not an ESM.

For which model system has it been tested?

How does it compare to other couplers: Exclusive use or can it be combined?

Is it in principle applicable to all model systems?

From the abstract a potential user of MESSy should be able to understand whether he can use the MESSy interface.

The vision should be made clearer: In principle, as far as I understand each process can be included independently, so that it is 'easily' exchangeable. The final goal would be to have just a runtime control and all other processes are linked via MESSy?

- In some cases it is not clear enough whether described requirements are meant to be general or specific for the described model system, and whether they are already realized.

E.g. the listed objectives are meant to be necessary for such kind of ESMs. However the reader gets the impression that one specific System (e.g. MESSy) is described. E.g. 'The model system is highly portable Ë', this is somehow confusing to the reader and can easily be avoided.

- What are the disadvantages?

Is it more time consuming?

Does the Interface layer need more memory to allow for global data exchange?

The Interface is a complex structure, a fast testing of new ideas ('quick and dirty') is not possible anymore?

Specific comments:

Abstract L2 A lot of model systems include already on-line couplings. The statement seems to be a little bit outdated. Please re-phrase.

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Interactive Comment

Objectives 7144 l 19/20: The quantification of the coupling process is much more complex then suggested here. The on-line quantification allows for local budgeting only. However, effects propagate through the model domains. Those effects are even with MESSy difficult to quantify. E.g. for the quantification of tong-term processes, like solar cycle, it is not enough to have localized budgets.

7145 l 22/23: Please make clearer that one possibility of achieving these requirements is the way the authors have chosen and that all points listed on page 7146ff. are describing the MESSy System.

7146 l 3-11 This is an important point, which should be included in the abstract, because readers should easily judge whether this system is applicable to their model system.

7150 l 12: Just to clarify. The interface in Fig. 6 is base model dependent and not the same in either case?

7151: MESSy has been included into ECHAM5 or vice versa?

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 7139, 2004.