MESSy Memorandum of Understanding

(Version of 12.11.2013)

Definitions

Licensee is you, only if you agree to be bound by the terms and conditions set forth in this Agreement.

MESSy shall mean the "Modular Earth Submodel System" as originally created by the members of the MESSy Consortium, and any Derivative Works thereof as created by either the MESSy Consortium or Licensee, but shall include only those Derivative Works the MESSy Consortium has approved for inclusion into, and the MESSy Consortium has integrated into MESSy.

Standard Version shall mean MESSy, as originally created and successively maintained by the MESSy Consortium.

Derivative Work(s) shall mean any revision, enhancement, modification, translation, abridgement, condensation or expansion created by Licensee or the MESSy Consortium that is based upon the Software or a portion thereof that would be a copyright infringement, if prepared without the authorisation of the copyright owners of the Software or portion thereof.

Software shall mean MESSy and the Derivative Works created by Licensee and the collection of files distributed with MESSy, and the collection of files created through textual modifications.

MESSy Consortium is the group of institutions (**Consortium Members**), which signed this **MESSy Memorandum of Understanding** (MoU).
The MESSy Consortium Website is `http://www.messy-interface.org`.

Consortium Steering Group (CSG) is the group of **Consortium Responsibles** (CRs), one per Consortium Member.
The Consortium Steering Group e-mail address is `messy_admin@lists.mpic.de`.

Community is the group of **End-User Licensees** at all Consortium Members. The Community Wiki is reachable via the MESSy Consortium Website.
The Community Mailing List address is `messy@lists.mpic.de`.

Earth System Model (ESM) is a generic term for the software package developed within the MESSy Consortium and subject to this MESSy Memorandum of Understanding.

Terms and Conditions

The terms and conditions for the usage of the Software are detailed in this **MESSy Memorandum of Understanding** and the corresponding **MESSy Software Licence Agreement**. The **MESSy Citation Rules** for proper scientific acknowledgement and the **MESSy Coding Rules** for further development are detailed on the MESSy Consortium Website for each released version of the Software.

Preamble

Numerical models are essential tools in earth system science and climate research. But the operation of these models, the analysis of their results, as well as the continuous improvement of their efficiency and its quantitative examination are connected with considerable and continuously increasing costs. Thus, the efficient use and further development of numerical models increasingly requires coordinated, joint actions of a large group of scientists.

The MESSy Consortium aims at integrating the by now distributed knowledge and methodologies of the earth system science and climate research communities into a joint Earth System Model of flexible complexity, which combines a global and a limited area model two-way nested into the global model coupled to an ocean model, different algorithmic approaches and various alternative process formulations. By this, the MESSy Consortium builds up a comprehensive but consistent chemistry-climate model system enabling numerical modelling of different atmospheric processes over different scales and considering all atmospheric layers from the troposphere up to the thermosphere. To achieve this goal, the MESSy Consortium makes use of the MESSy infrastructure.

This model system and its components developed within the MESSy Consortium are made available and shared within the scientific community.

However, the MESSy software and the Earth System Model developed must remain controllable and documented. This is the spirit behind the following MESSy Memorandum of Understanding together with the MESSy Software Licence Agreement (*Appendix 1*). This MESSy Memorandum of Understanding is crafted as an institutional licence, which has to be accepted before an institution can get the MESSy Software, as the MESSy Consortium knows that typically several users in one institution share such software and develop it further in a group effort. The MESSy Community End-User Licence Agreement (*Appendix 2*) ensures that each user within an institution, which has accepted the MESSy Memorandum of Understanding, has seen and accepted the terms of this MESSy Memorandum of Understanding and the MESSy Software Licence Agreement, and it also allows the MESSy Consortium to maintain an end-user data base, which ensures efficient communication of updates and revised versions of the Software. It is also important to provide feedback to the model developers, to report about errors and to suggest improvements of the code.

The MESSy Consortium must also ensure that the MESSy Software is protected from misuse and false statements about its characteristics and performance. Therefore, all alterations to the Software have to be marked clearly and publications of results obtained with modified versions must contain a description of the changes made.

Purpose of the MESSy Memorandum of Understanding

The aim of the MoU signed is to facilitate and to assure a coordinated further development and maintenance of a joint ESM based on the MESSy infrastructure as a community model of university institutes and research centres of atmospheric and climate research, a joint conduct and analysis of simulations, the exchange of experience and results in the field of atmosphere and climate modelling and the support of external users of the simulation results in the utilization and interpretation of the data.

The following points regulate the handling of the model and the cooperation of the Community members. All members *(see Membership*) of the Community recognise the regulations stated herein as obligatory.

Membership

Institutional membership
Every institution that wishes to use the ESM for its research purposes and accepts the MoU without restrictions can become an institutional member of the MESSy Consortium. This membership is effected by means of an informal application to the CSG and has to be confirmed by the CSG.

This application must contain

- a signed copy of this MoU
- with a declaration of consent to obey the MESSy Software Licence Agreement (*Appendix 1*),
- copies of the licence grants for third party software for which the MESSy Consortium is not copyright holder,
- a Letter of Intent with a description of the intended scientific work for which the Software is to be used.

In case of possible conflicts between two or more Consortium Members due to the Letter of Intent the CSG can ask for an agreement between the Consortium Members.

The institutional membership is documented by listing the Consortium Member and a description of the intended scientific work on the MESSy Consortium Website and the Community Wiki.

Every institution has to determine a Consortium Responsible (CR) who will become member of the CSG.

The membership in the MESSy Consortium of the institution ends when it revokes the licence agreement.

Personal membership
Every person affiliated with a research institution that is an institutional member of the MESSy Consortium, who wishes to use the model for his/her own research purposes and accepts the guidelines stated herein without restrictions, can become a personal member or end-user of the MESSy Community and get access to the ESM and the Software. This personal membership is effected by means of an informal application to the CSG and has to be confirmed by the CSG.

End-users have to

- sign and follow the MESSy Community End-User Licence Agreement (*Appendix 2*),
- provide a detailed Letter of Intent to the CSG, which contains
    - the institution with full address,
    - the e-mail address of the end-user,
    - a description of what is intended to do with MESSy (including a description of planned funding proposals),
    - a list of MESSy submodels to be used (*see MESSy Submodels on Consortium Website*),

- provide to the CSG a copy of the licence grant for third party software for which the MESSy Consortium is not copyright holder,
- follow the MESSy Citation Rules (*see Consortium Website*),
- follow the MESSy Coding Rules (*see Consortium Website*) for further development of MESSy,
- inform the CSG about plans to apply for external funding, if the proposal involves the application and/or further development of MESSy (in order to avoid conflicts of interest).

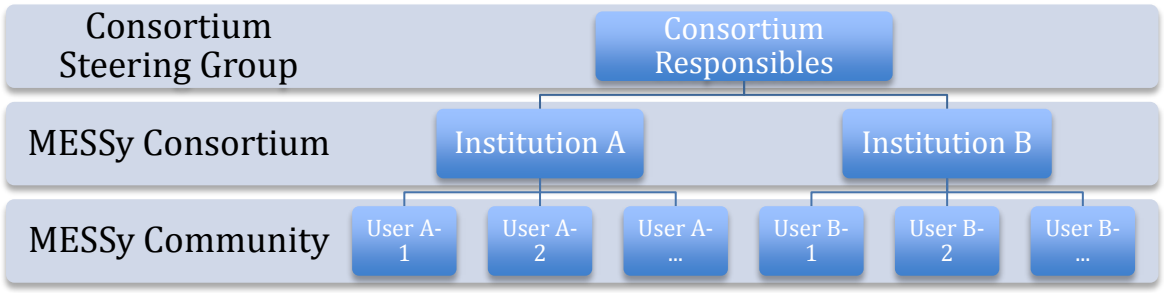
The CR of the institution has to inform the end-user about the regularities of the MESSy Consortium and will include in the Community Wiki the name of the end-user on the end-user list together with a description of the intended scientific work for which the model is to be used. In addition, the end-user has to inform the CR about possible changes of the intended scientific work so that these changes can be included in the Community Wiki.

Due to the personal membership the end-user obtains an individual right on the usage of the model system on the basis of the institutional licence and will be informed directly about the further development of the Community Software via e-mail lists and get access to the Community Wiki.

The personal membership ends by leaving the institution.

Organisational Structure

Three organisational bodies are established for the coordination of the activities, the support of the exchange of information, the maintenance of code and documentation, and the visibility within the scientific community.
The MESSy Consortium is the group of institutions (Consortium Members), which signed this MESSy Memorandum of Understanding.
Every institution determines a Consortium Responsible who will become member of the Consortium Steering Group, the group of Consortium Responsibles.
The MESSy Community is the group of end-user Licensees at all Consortium Members.



Utilisation of the Software (Rights and Obligations)

The ESM and the MESSy infrastructure, as well as included routines for pre- and post-processing, are made available for every end-user for the time of his/her membership in the Community. The commercial utilisation of the Software within the framework of this agreement is explicitly forbidden. Furthermore, passing the Software on to third parties is

excluded. This applies to all existing versions of the model, including those developed as interim or improved solutions.

The Community member **is allowed to**

- conduct his/her own simulations using the model and publish his/her results,
- pass on the results obtained to third parties,
- change the model code for test purposes, required adaptations and extensions, and general improvement of the model quality.

The Community member **has to**

- explain to the Community the intended work with the model for the purpose of better coordination of their activities,
- make the achieved results available to the Community,
- return the model modifications to the Community,
- stick to guidelines for code structure and documentation when returning altered model versions,
- take measures for quality assurance, which guarantee the reproducibility of the results achieved,
- pass on the identified errors in the code or in the results immediately to the MESSy Consortium by informing the CR and the CSG. The corrected source code has to be forwarded immediately to the CR and the CSG. It will be evaluated within the framework of the standard evaluation of the subsequent version.

The Community member **should**

- inform the Community about problems and progress during the work in timely manner,
- participate in joint end-user meetings,
- inform the Community about presentations and publications which contain results achieved by using the model via the Community Wiki,
- stick to the recommendations made by the DFG (Deutsche Forschungsgemeinschaft) for securing good scientific practice.

A joint utilisation of simulation results and an intensive exchange of experience during model development are explicitly desired and are supported by the CSG.

Model Development and Documentation

A major aim of the MESSy Community is to systematically further develop the ESM and the MESSy infrastructure through continuously improving individual model components and by extending existing or adding new process and diagnostic modules.

In this section, general rules are summarised, which have to be fulfilled by code developers.

a) General aspects:

Coordinated model development: Improvements and extensions of the ESM software by end-users or work teams should always be in line with the scientific/technical planning coordinated by the CSG.

Before starting a new ESM software development, the end-user shoud contact the CSG. In general, the improvements and extensions of the ESM should be done on submodel or subsubmodel level. In case of improvements and extensions to an existing submodel, the

submodel maintainer (who is listed on the MESSy Consortium Website) has to be contacted before.
This aims to avoid unnecessary double work and to use already existing experience in a better way. The final decision on changes to the ESM software is taken by the CSG.
Information about model developments: After the completion of work or single work steps, the Community is informed about the results of the model extension by presentation at the joint end-user workshop.
The CR, who is named by the institution (*see Membership*), can be contacted in case of questions or problems. In order to assure good quality code and support, there is the need that all components of the code do have a responsible person (submodel maintainer).
The administration of the Standard Version is organized by the coordinating CSG.

b) Coding rules:
The source code provided must be properly designed and conform to the coding rules (*see MESSy Consortium Website*). Alterations and extensions of the model code need to be integrated in such a way that results of previous versions can be reproduced at any time. Exceptions are corrections of model bugs.
The decision whether the coding rules are fulfilled is taken by the CSG.

c) Documentation of model developments:
Together with the modified source code the developer has to deliver a process documentation of the implementation (i.e. extensions, changes, bug fixes) in a form accepted by the CSG. It has to be well understandable and complete in the sense that the extensions and/or modifications can be identified by other end-users.
A publication of the model development in the open access journal "Geoscientific Model Development" (GMD) is approved and highly appreciated.
In the case of further developments of model physics and dynamics a documentation of the results needs to be made available to the Community.

d) Quality control and quality assurance (Testing)
The quality control and quality assurance is documented in the "check-in procedure" as part of the Coding Rules, which are available on the MESSy Consortium Website, and which regulate the required checks to be performed by the developers (and the submodel maintainer, if necessary) before first submission to the CSG.
The minimum technical prerequisites of new submodels or new submodel features are:

- the new submodel or feature must compile without errors on a reasonable subset of supported compilers,
- the new submodel or feature is switched OFF by default,
- the new submodel or feature has no side-effects if it is switched OFF.

Developers are encouraged to check-in also un-evaluated "alpha-versions" of their new submodels (which fulfil the above-mentioned requirements) to facilitate the beta testing by other users. The usability status of new submodels is defined for each new official Standard Version release by the submodel maintainer and regulated by the traffic-light system, which is documented on the MESSy Consortium Website. Modifications/extensions of existing submodels require the agreement of the submodel maintainer, and therefore require an information/involvement of the maintainer from the very beginning of the development.

Before a new submodel or feature can become "operational" (green traffic light), it has to be thoroughly evaluated by the developers (and the submodel maintainer, if necessary) in a process-oriented evaluation approach and documented, preferably in GMD.

e) Status of the model version:
Two different model versions are defined:

1) Standard Version shall mean MESSy, as originally created and successively maintained by the MESSy Consortium. This Standard Version is released to the MESSy Community.

2) Derivative Work(s) shall mean any revision, enhancement, modification, translation, abridgement, condensation or expansion created by Licensee or the MESSy Consortium that is based upon the Software or a portion thereof that would be a copyright infringement, if prepared without the authorisation of the copyright owners of the Software or portion thereof. The Derivative Work(s) should be merged into the next official version to guarantee standards. The corresponding developer group should regularly report to the CSG to avoid redundant work.

Archiving and Availability of Results

The MESSy Community members commit themselves to keep a high scientific-ethical standard when communicating with each other and while handling their scientific results. The recommendations of the DFG commission "Self-control in Science" for securing good scientific practice serve as the basis for their scientific work provided they can be applied to the tasks involved in the daily work and the structures concerning this community. If detailed implementation of these recommendations, which is obligatory for the staff at the institutions involved, does not exist, the DFG's general guidelines, as outlined in "Suggestions for the securing of good scientific practice" of January 1998, can be used as an orientation.
In order to guarantee the community's high quality demands to their scientific way of working, the results of relevant and especially published simulations are always to be documented in such a way that their reproduction is possible at any time. In addition to archiving the driving data used and the numerical simulation results achieved, this also includes the securing of the model configuration (programme codes and the accompanying control variables). The respective data and codes are to be archived by the creator of the model results and kept beyond the end of his/her own scientific work in accordance with the suggestions made by the DFG for securing good scientific practice.

Publications

For publication of results based on MESSy in a scientific journal, the Creative Commons Attribution – Non Commercial – Share Alike Licence applies.

In particular,

- **you** are requested to consult the CSG on proper acknowledgement, and in particular on potential co-authorships, during the early drafting phase of your manuscript (publication or proposal). Please recall that all submodel maintainers should be contacted individually about the use of the Software, recent bug fixes and other changes, and proper acknowledgement or co-authorship (*see the traffic light regulations on the MESSy Consortium Website*). We will only request co-authorship for model developers where it is really appropriate.
- **you** (as end-user using MESSy or stand-alone components of MESSy in planned publications or proposals) are requested to upload a pre-print of your draft manuscript at least two weeks prior to submission to the Community Wiki, to provide some time to check and prevent misinterpretation of model results and conflicts of interest. If you

object to this procedure, please send it to the CSG, who will instead distribute the draft only to submodel maintainers involved.

- **you** are asked to cite the application of ECHAM5/MESSy and third party software as given on the MESSy Consortium Website**.**

Appendices

Appendix 1: MESSy Software Licence Agreement

Appendix 2: MESSy Community End-User Licence Agreement

MESSy Memorandum of Understanding

(Version of 11.12.2013)

Signatures

Hereby I,

_____,
(Name)

head / director of

_____,
(Institution)

declare that I

- read and understood this **MESSy Memorandum of Understanding**,
- read and understood the corresponding **MESSy Software Licence Agreement**,
- read and understood the **MESSy Citation Rules** (*see MESSy Consortium Website*),
- read and understood the **MESSy Coding Rules** (*see MESSy Consortium Website*),
- and agree with all the regulations mentioned therein.

A detailed **Letter of Intent** for the usage of the Software is attached. Copies of **licence grants of third party software**, of which the consortium is not copyright holder, are attached (if applicable).

I herewith apply for an institutional MESSy Consortium membership.

_____

(Place, Date) (Signature of the Head of the Institution)

I herewith declare the following member of my institution as Consortium Responsible (CR).

_____

(Name of the CR) (Signature of the CR)

Please print out the last page of this document, fill out the form and e-mail a scanned copy (as PDF) together with the Letter of Intent (as PDF) and third party software licence grants (as PDF) to the CSG.
The Letter of Intent must contain your full name, your institution with full address, your e-mail address, and a description of the intended scientific work for which MESSy is to be used.