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TO OUR CUSTOMERS

New release of your MICRESS® software package.

Dear MICRESS user,

Enclosed please find the most recent release of your MICRESS® software package. The present release 6.3 of MICRESS® comprises a number of improvements and new functionalities. Of course we also attempted to fix all bugs being reported by our user community.

MICRESS® 6.3 has been carefully tested and now is available in different variants for different operating systems:

For the current standard installation of MICRESS® Release Version 6.3 following platforms are supported – all 64 bit only -:

- Windows 7 / 8 / 10 (Update status from October 2016)
- OpenSUSE 12.2 – 13.2, Leap 42.1
- CentOS 7.0
- Ubuntu 16.04 (LTS)

MICRESS® 6.3 is linked to Thermo-Calc TQ library from the release TC 2015b and GES5 files created with the newest Thermo-Calc releases are compatible. Creation of .ges5 files for MICRESS® 6.3 requires Thermo-Calc at least in version 3.0 Older .ges5 files being created using e.g. the TCC-S version are not further supported. A new MICRESS-TQ-license file is provided along with the release mail.

Please note: It is necessary to update any existing license management (FlexNet Publisher, resp. FlexLM) to version 11.13 as provided with this release. Older license systems are not further compatible.

MICRESS® 6.3 is also supplied as a partly parallelized version. Diffusion, stress, flow and temperature solvers can be executed multithreaded based on OpenMP (www.openmp.org).



In addition, the following free tools are provided along with MICRESS either on the release DVD or as download from the MICRESS® website (www.micress.de) for both Windows and Linux operating systems:

DP_MICRESS (version 7.1) is included into the present distribution of MICRESS® 6.3. This powerful postprocessor contains numerous functionalities and operation of DP_MICRESS has become intuitive. Scripts allow customizing the appearance of the screen and pre-configured tools allow numerous operations on the result files.

MICpad (Version 1.0) allows for editing driving files. Bookmarks, colored comments and input strings largely facilitate navigating and editing especially large driving files. **MICpad** further acts as a control center allowing starting and monitoring the simulations as well as monitoring and organizing the results. Some graphics have been implemented into **MICpad** to visualize e.g. the linearized phase-diagrams in case of noTQ coupled MICRESS® simulations.

In future, we will add **useful scripts** being used by ourselves or being developed and provided by our customers. These scripts will be made available without any warranty and liability. The present release comprises the script "picture to MICRESS", which is useful for reading in 2D experimental microstructures.

new input/output options:

The release 6.3 of MICRESS® comprises a some new I/O options being depicted in the following:

- „Restart“ functionality now is downward compatible with elder restart files (starting from Version 6.200).
- „Restart_structure_only“ allowing to read combinations of different microstructures now allows also for rotations of the initial configurations in steps of 90°.

improved performance:

A number of measures have been taken to improve performance e.g. :

- improved storage of local diffusion coefficients and other data
- improved handling of boundary conditions
- improved time stepping in diffusion calculations
- reduced memory allocation in specific routines
- improved efficiency in calculation of total phase fractions and average composition
- improved efficiency in categorization of grains
- improved TQ-coupling routines for identification and separation of different composition sets



new functionalities/new features:

- The misorientation model has been extended by user-defined 'Special Misorientation Boundaries'. Typical examples are twin and twist boundaries related to high coincidence site lattices ($\Sigma 3$, $\Sigma 9$, ...).
- Inert phases being e.g. used to mimic non-rectangular boundaries of a simulation domain can now be used also with a diffuse interface avoiding discontinuities due to the discretization scheme.
- A new nple/paraequilibrium model allows for consistent control of redistribution at triple junctions comprising three different phases e.g. austenite, ferrite, cementite.
- Interface mobilities for diffusion controlled growth can be automatically determined now. Calculated mobilities can be further fine-tuned by defining factors for each of the chemical elements.
- The interaction of different phases being identical in their thermodynamic description but differing in other attributes like anisotropy or kinetics is now supported. Examples are e.g. eutectic Si/ primary Si or nucleation of acicular ferrite grains with specific orientation relations.
- The „elastic module“ can handle temperature dependent elastic properties and temperature dependent molar volumes now. Data can either be read from ASCII-files or from database.
- The "offset" keyword in the dG-options allows adding an offset to the driving force. This feature may be used to fine-tune thermodynamic databases. Another application of this feature could be the treatment of martensite as ferrite but with adding an offset in the driving force.

further important new features:

License system: license re-checks in case of a lost license are now performed after 10, 30 and 60 seconds, followed by checks after each 300 seconds. This allows for seamless continuation of simulations e.g. in case of a license server shut-down.

examples:

- With the exception of the CMSX4 example all examples can now be run without requiring a respective database license.
- Two new examples ('Grain_Growth_Misorientation_3D', 'Gamma_Alpha_FeC_Acicular') have been added to demonstrate the new 'Special Misorientation' model.



various

- Several changes in internal data formats and algorithms lead to improved performance.
- The license manager (FlexNetPublisher Version 11.13.1.3 (FlexLM)) supports also IPv6 type domain specifications. The use of this license manager or higher versions thereof is required from the present version MICRESS® 6.3.
- The new release of HOMAT is scheduled for December 2016

documentation

The distribution of MICRESS® 6.3 comprises the following 5 volumes of the manual, which have been updated to include descriptions for all new features and options:

- MICRESS® manual Vol.0: MICRESS® - phenomenological background
- MICRESS® manual Vol.1: MICRESS® installation
- MICRESS® manual Vol.2: running MICRESS®
- MICRESS® manual Vol.3: MICRESS® post processing
- MICRESS® manual Vol.4: MICRESS® examples

We do hope that these improvements will assist you in solving your problems and will continue to make MICRESS® a valuable tool for your research. For more details, please don't hesitate to ask us, preferentially via the MICRESS®-Forum (www.micress.de/forum).

Yours sincerely
ACCESS e.V.

Dr. Georg J. Schmitz
Global Marketing, Sales & Support MICRESS®