Release Notes 2023

FEFLOW

Contents:

Introduction

Welcome to FEFLOW 8.0 Update 2 within MIKE 2023

In this Release Note, you will find information about new features of FEFLOW, and what you need to know to install and get started.

Groundwater projects are becoming more and more demanding - requiring modelling software with more sophisticated capabilities than ever before. FEFLOW provides best-in-class technology for groundwater flow, contaminant, groundwater age and heat-transport simulations. With its efficient user interface and its yet unmatched range of functionality, FEFLOW has become a standard in premium groundwater modelling over the last 35 years.

MIKE 2023 comes with a major FEFLOW 8.0 release. The release reveals additional support to the conceptual modelling approach. Together with a new workflow for building 3D models (layered-based, partially unstructured and fully unstructured) from 2D datasets, the new functionality will help groundwater modelers to create FEFLOW's models faster than ever. The release introduces the possibility to repair improper 3D data (geometrical non-conformities) such as surfaces and polylines imported into FEFLOW for the generation of 3D Supermeshes. FEFLOW 8.0 comes with a new functionality and UI component dedicated to the management of well objects (Well Manager). The Well Manager allows the easy creation, editing and deletion of groundwater wells (incl. flow, mass and heat transport boundaries). Together with the official release of MIKE Cloud, FEFLOW and FePEST GUIs support the deployment one or multiple FEFLOW runs to the cloud with just one-click. Several improvements to the Selections panel and their usability are also offered in this release

FePEST presents an extended Parallelization Status panel with the possibility to include more workers (local or external) during an ongoing PEST/PEST++ optimization run. FePEST observation charts have been reviewed and now the observation names are better identifiable throughout the multiple result charts.

System requirements

Operating systems

Fully supported Windows operating systems *	Windows 11 Pro, version 22H2 (64 bit) Windows 10 Pro, version 22H2 (64 bit) Windows Server 2022, version 21H2 Windows Server 2019 Standard, version 1809
Fully supported Linux operating systems *	Ubuntu 20.04 LTS and 22.04 LTS CentOS 7 (Platform el7): CentOS Linux 7 (Core) | RHEL | Fedora CentOS 8 (Platform el8): CentOS Stream 8 | RHEL | Fedora

Non-supported but partially tested operating systems **	Windows Server 2016 Standard, version 1607

* Fully supported operating systems are systems that have been tested in accordance with MIKE's Quality Assurance procedures and where warranty and software maintenance agreement conditions apply.

** Non-supported but partially tested operating systems are systems, which are not officially supported by the MIKE software products. These operating systems have only undergone very limited testing for the purpose of MIKE software, but the software and key features are likely to work. Installation of MIKE software on a non-supported operating system is done so at the user's own risk. The MIKE software warranty and software maintenance agreement conditions do not apply for unsupported operating systems and DHI is under no obligation to provide assistance or troubleshooting for cases where the software is being used on a non-supported operating system.

Please note that when running a fully supported operating system as a 'guest operating system' on a virtualization platform, it is automatically downgraded to a non-supported operating system under the conditions provided above.

Minimum hardware/software requirements

Processor	compatible with x64 instruction set, 2.2 GHz or higher
Memory (RAM)	4 GB or higher *
Storage	64 GB or higher *
Display	resolution 1024 x 720 (High-Definition) or higher, 24-bit color (true color)
Graphics adapter	≥ 2 GB memory, ≥ 24-bit color, Shader version ≥ 1.30, minimum hardware accelerated OpenGL ≥ 2.0 / recommended hardware accelerated OpenGL ≥ 3.0 with fully supported Windows drivers
Software requirements	Microsoft .NET Framework 5.0 or later

* The actual required amount of memory and disk space depend on the usage (application, model setup, size of data files etc.)

Installation

To install FEFLOW, please go to the ’windows’ folder inside the ‘FEFLOW' product folder and execute the ‘start.exe’ file either on the MIKE 2023 USB or from the downloaded, un-zipped installation files. Press the ‘Install’ button to begin installation.

To start the FEFLOW installation, please click on 'FEFLOW Program Files'. It is recommended to allow the setup program to check for the latest patch on the MIKE Powered by DHI website to avoid any known and already fixed bugs.

All necessary FEFLOW files and folders will be installed on your PC. Additionally, a FEFLOW entry in the Start menu is created, containing links to FEFLOW itself and some supporting programs.

License file and dongle

Please Note that when using the local or network license option, which require a license file and a dongle, then

- the DHI License Manager must installed separately.
- all licensed applications included in MIKE 2023 require a 2023 version of the DHI License Manager.
- a new license file format (file extension dhilic2) has been introduced with MIKE 2022 and these license files can only be used together with a DHI License Manager 2022 or newer.

To use FEFLOW software in licensed mode, please refer to the DHI License Manager Release Notes. (License Manager Release Notes).

Product invocation

To start FEFLOW, double click on the FEFLOW 8.0 icon on your desktop or launch FEFLOW from the Windows Start menu and select the program you would like to start. Typically, this will be 'FEFLOW Standard (64-bit)' or the free viewer 'FEFLOW Viewer (64-bit)'.

Starting FEFLOW without a valid license, it is recommended to switch to demo mode via Tools - License Setup in the main menu. This mode is indicated by the word 'DEMO' in the header of the FEFLOW application window. Running in demo mode, file loading and saving is limited to 2500 nodes.

Support

For general support, please refer to our Customer Care Portal.

If you experience any difficulties, or if you have questions, please contact our Customer Care team at mike@dhigroup.com.

You can also contact your local Customer Care team for support in your local language. A list can be accessed from here.

New features and fixed issues

Every new release of FEFLOW consists of new modules, new features and/or corrections to problems or significant inconsistencies discovered in previous releases. Please find below short descriptions of the most significant news.

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New features

Module/type	New feature
FEFLOW / Supermesh	New set of interactive tools: 3D Supermesh Points, 3D Supermesh Polyline, 3D Supermesh Plane and 3D Supermesh Bounding Box.
FEFLOW / Supermesh	The new Add Supermesh Elements dialog accessible via menu Edit allows the user the possibility to include several new map files for updating the 3D Supermesh.
FEFLOW / Supermesh	Several maps available in the Maps panel can be now simultaneously selected to create new 3D Supermesh Elements.
FEFLOW / Supermesh	The generator list in the Meshing panel has been extended to include Geode 3D mesh generator. Generator supports a fully 3D meshing from an existing 3D Supermesh.
FEFLOW / Supermesh	Several workflow improvements and maintenance tasks associated to 3D Supermesh Remesh / Repair (Update to Geode-FEFLOW v. 2.4.3).
FEFLOW / Maps	Improved handling of map files included in FEFLOW documents (*.fem, *.dac and *.smhx)

FEFLOW / Usability	Improved handling in Well Manager (GUI) for import/export functionality.
FEFLOW / Python	Improved handling of set/get methods for porosity parameter used in Particle Tracking class.
FEFLOW / Python	New Python interface for the Well Manager: create, edit and delete Well BC, Multilayer Wells and Borehole Heat Exchangers boundaries directly from Python.
FEFLOW / Python	Extension of FEFLOW's Enum to support material lookup tables.

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New features

Module/type	New feature
FEFLOW / File IO	Introduce a compressed file format for large 3D Supermesh files. Option is available under Problem Settings - File I/O Settings.
FEFLOW / Supermesh	Improved performance for loading Supermesh SMHX documents.
FEFLOW / Supermesh	Supermesh Processing panel can now filter out surfaces that are not part of any closed volume.
FEFLOW / Supermesh	Significant performance improvement for updating the 3D Supermesh after repairing workflow.
FEFLOW / Supermesh	Improved performance for importing GOCAD TS files and their subsequent conversion to 3D Supermesh elements.
FEFLOW / Supermesh	Added an inspection mechanism for recognizing line segments closed to surfaces (Threshold 1e-3 to 1e-6 [m]). Output is written under Entities panel - Surface Locations and can be used as for debugging purposes of the 3D input data.
FEFLOW / Supermesh	Several bug fixes in the Supermesh surface repair/remesh (update to Geode-FEFLOW v. 2.2.2).
FEFLOW / Usability	Improved performance in FePEST at the time to add FEFLOW observations.
FEFLOW / Usability	Improved sign in/out to MIKE Cloud from the Simulations Cloud panel.

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New features

Module/type	New feature
FEFLOW / Usability	New workflow to provide elevation data and slice information from a 2D Supermesh.
FEFLOW / Usability	Automatic workflow for the creation of 3D models (layered-based and partially/fully unstructured) from a 2D Supermesh
FEFLOW / Usability	Extension of new conceptual modelling approach: Support of Supermesh line and point properties.
FEFLOW / Usability	Integration of Geode Solutions technology for repairing surfaces and polylines within a 3D Supermesh.
FEFLOW / Usability	Integration of Geode Solutions technology for re-triangulating 3D Supermesh surfaces.
FEFLOW / Usability	New functionality and UI component dedicated to the management of well objects, Well Manager editor.
FEFLOW / Usability	Several improvements in the Selections panel: search functionality, keystroke combinations for activating selections, split of selections items, etc.
FEFLOW / Calculations	Official release of MIKE Cloud for FEFLOW and FePEST allowing the cloud-deployment of model runs as a one-click solution from the GUIs.
FEFLOW / Python	FEFLOW-Python interface supports Python versions 2.7 and 3.8-3.11.
FEFLOW / Python	FEFLOW-Python interface supports the use of external Python packages with the FEFLOW console.
FePEST / Usability	Extension of the Parallelization Status panel for including workers (local and external) during an ongoing optimization. Visualization of CPU and Memory per worker groups.
General	Several GUI improvements and bug fixes in FEFLOW and FePEST.