Release Notes 2022

FEFLOW

Contents:

Introduction

Welcome to FEFLOW 7.5 Update 1 within MIKE 2022 Update 1

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

FEFLOW comes with a new conceptual modelling approach for creating and updating models faster than ever. The release introduces significant improvements in the numerical methods such as a new solver package PETSc (incl. GPU-accelerated PETSc AMG solver for Linux), updated version of SAMG solver and an extended formulation of the error norms and tolerance. The FEFLOW Python, IFM and Console comes with additional API and switches. The new Cloud Simulations panel supports now the user to deploy one or multiple FEFLOW runs to the cloud with just one-click from the FEFLOW / FePEST GUIs. In the FEFLOW GUI, we have now new ways of operating with many selections.

FePEST presents new integration to the PEST++ package for allowing a new method for model calibration and uncertainty quantification in one run (PEST++ Iterative Ensemble Smoother). Parallelization in the FePEST context is improved with a new run manager.

System requirements

Operating systems

Fully supported Windows operating systems *	Windows 11 Pro, version 21H2 (64 bit) Windows 10 Pro, version 21H2 (64 bit) Windows Server 2022, version 21H2 Windows Server 2019 Standard, version 1809
Fully supported Linux operating systems *	Ubuntu 20.04 LTS (Debian) 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

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To install FEFLOW, please go to the ’windows’ folder inside the ‘FEFLOW' product folder and execute the ‘start.exe’ file either on the MIKE 2021 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 2022 require a 2022 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 7.5 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 FAQ.

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. You can find the list 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.

Release 2022 (FEFLOW 7.5.1)

New features

Module/type	New feature
FEFLOW / Calculations	New Cloud Simulations panel in FEFLOW and FePEST GUIs for executing one or multiple simulations in the cloud.
FEFLOW / Usability	Extension of new conceptual modelling approach: Material regions can be defined through map import during the generation of 2D/3D Supermesh.
FEFLOW / Usability	Extension of new conceptual modelling approach: Visualization of material names in the Supermesh View (2D).
FEFLOW / Usability	Better accessibility of the DHI FEFLOW plug-ins through the Problem Settings dialog.
FEFLOW / Usability	Support of BHE dataset name through map files for the Parameter Association.
FEFLOW / Numeric	Enhancement of new SAMG version 2020 handling.
FEFLOW / Numeric	GPU support for PETSc AMG solver (Linux only).
FEFLOW / Hydrodynamics	Several improvements of hydrodynamical coupling FEFLOW – MIKE 1D: Coupling definitions via selections and new coupling settings (transfer rates, mapping of nodes, time stepping, among others).

FEFLOW / Console	New option to monitor the CPU time and number of iterations required for the solvers.
FEFLOW / Usability	Diverse several GUI improvements and bug fixing.

Release 2022 (FEFLOW 7.5.0)

New features

Module/type	New feature
FEFLOW / Usability	New conceptual modelling approach for defining material information before generating a mesh.
FEFLOW / Usability	Support of material regions and parameter lookup tables for fast model updates.
FEFLOW / Usability	Possibility to group (ungroup) selections, sort selections and do operations of content/budget analysis at the group level.
FEFLOW / Numeric	New SAMG version 2020 for enhanced memory management and improved parallelization.
FEFLOW / Numeric	New solver package PETSc including Krylov-based methods, AMG solver and GPU-accelerated preconditioning.
FEFLOW / Numeric	Separate error norm type and tolerance per problem class (flow, mass and heat).
FEFLOW / Usability	Access a new input unit (Energy demand) for BHE configuration.
FEFLOW / Hydrodynamics	Custom Feature “Hydrodynamics” for analyzing the interaction between surface water and groundwater (coupling FEFLOW and MIKE 1D engines).
FEFLOW / Usability	Import of DFS2 files (e.g., MIKE SHE groundwater recharge or other) directly in FEFLOW.
FEFLOW / Usability	New data regionalization method “Area-weighted Projection”.
FEFLOW / FePEST	Support of the PEST++ package (including IES and GLM methods).
FEFLOW / FePEST	Support of new parallelization manager PANTHER.
FEFLOW / IFM	Access to more than 20 new APIs to support the new conceptual modelling approach.
FEFLOW / Python	New multi-threading control for FEFLOW Python runs.
FEFLOW / Console	New option to perform a switch in the equation solver in the FEFLOW console.