December 27, 2022

BETA CAE Systems announces the release of the v23.1.0 of its software suite

About this release

Dedicated to investing in cutting-edge engineering simulation technologies and industrial applications, BETA CAE Systems comes up with another major release of v23.x.x series.

v23.1.0 aims to extend automation while, same time, manage complexity and offer more scalability.

Do not miss:

- The advancements in Human Body Models, supporting the new diversity models of THUMS family for ANSA and THUMS M50-O and F05-O for META.
- The complete solution for Isogeometric Analysis, expanded in pre- and now also implemented in post-processing, facilitating the reading of geometry and deformation results from LS-DYNA d3plot files.
- The enhanced functionality for watertight model preparation and surface wrapping for aerodynamic applications.
- The vast developments in post-processing for NVH, including new toolbars as well as the co-simulation of modal transient response with third-party applications.
- The significant speed-up in EPILYSIS calculations regarding SOL200 optimization with modal frequency response loadcase, combined with AMLS substructuring.
- The noteworthy performance improvements in the area of Machine Learning Prediction in KOMVOS.
- The further potential of SPH solver, providing a broader range of applications and a significant speed-up of execution.

With the version 23.1.0, our suite is enhanced with a new software FATIQ. This is our new offering for Fatigue life prediction based on FE results, offering an easy and intuitive solution for the set-up, solving and post-processing of a Fatigue life analysis.

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Release Highlights

Unleashing the pre-processing potential in ANSA

The unification of TOPO and MESH functionality, introduced in major v23.0.0, is being further boosted by expanding the unified direct

geometry and mesh manipulation to FE entities as well.

Moving on to mesh generation for CFD and aerodynamic analyses, surface wrapping has been enriched with advanced user control on feature capturing per different areas, coupled with optimized performance by using multi-cores. Watertight model preparation has been expedited by new algorithms detecting and isolating interior and exterior areas of complex geometries. New functionality for layers introduces variable first layer height via linear variation or according to flat plate theory.

The Isogeometric Analysis, already introduced in prior BETA versions, is gaining ground with a now greater range of new IGA keywords support, as well as an even more efficient management of the IGA patches.

Getting into the core of the Crash and Safety area, Human Body Models Articulation is being further supplemented with a greater range of postures, along with metadata available for the new diversity models of THUMS family. Moreover, the Bicycle Configurator tool, introduced in the major v23.0.0, now additionally provides I/O of all current angles of each HBM part from/in a JSON file.

As far as the multibody simulations are concerned, Kinetics module now supports quasi-static simulations for running a sequence of equilibrium simulations in time domain, as well as a new type of simulation for calculating the eigenvalues of a dynamic system. Moreover, the embedded beam generator tool provides automated modeling of beam structures and DOF-restrains can now be applied directly on rigid bodies.

Focusing on structural analysis, apart from new patterns for the realization of solid bolts, the direct job submission, already implemented in prior versions for Abaqus, Pam-Crash, and LS-DYNA, has been expanded. Monitoring and error handling is now possible also for Marc, Nastran, Ansys, Optistruct and Permas.

Closing with our latest developments for Electromagnetics, the setup of post-processing electromagnetic results is now a reality via the ASERIS plugin in ANSA.

Boosting optimization calculations in EPILYSIS

The new version offers a significant speed-up in calculations regarding SOL200 optimization with modal frequency response loadcase, combined with AMLS substructuring. The full support of the creation and assembly of modal damping matrices for modal model solutions is also one of the groundbreaking implementations that v23.1.0 comes live with.

Further integrating our solutions in META

Graphics in post-processing are always an asset for META. Towards this direction, in v23.1.0, 360 images and videos can be exported both for desktop and VR.

One of the main implementations the new version provides, is the complete solution for Isogeometric analysis from pre- to post-processing. Geometry and deformation results derived from Isogeometric Analysis elements from LS-DYNA d3plot/d3iga files, can now be successfully read in META.

In the NVH field, v23.1.0 hosts an abundance of noteworthy implementations. The Surface Polynomial Fitting Toolbar provides Zernike modes contributions for disc-shaped deformed structures, whereas the Damping Estimation User Toolbar can be used to Estimate the damping ratio from curves in frequency and time domain. Modal Transient Response can co-simulate with third-party applications via a Functional Mock-Up Interface (FMI). A compact form of an FRF component can now be saved in a metadb resulting in a reduced file and improved I/O performance when used in the FRF Assembly tool. Moreover, User productivity for NVH analysts is further increased through the direct access and navigation to available diagnostic results for top peaks of a specific 2D response.

Consistently placing our focus on various developments in all domains, follow some representative, highlighted cases:

- For Crash & Safety applications, THUMS M50-O and F05-O in Human Body Models Post tool are now supported.

- For Durability applications, Marc HDF format is fully implemented.

- For Molding applications, ESI ProCAST ERF format and Moldex3D solid mesh module for geometry and results have been introduced.

- Laminate information from ANSA comments inside the Ansys .cdb output file can now be retrieved and initial laminate structures can be recreated.

Process design and productivity excelled through KOMVOS

A new feature comes with KOMVOS v23.1.0 which offers the ability to the user to search within Simulation Data using text queries in natural language. On top of that, the Machine Learning Prediction now hosts a brand-new interface with first level view of the predictors KPIs, direct switch between predicted results, and interactive predictions. Additionally, optimal design exploration can be achieved by Smart Sampling, whereas a mode classifier trained with the normal modes result files is now able to generalize and classify the mode-shape types for any FE model.

Streamlining results through SPH solver

Apart from the broader range of applications and the significant speed-up of execution, a plethora of feature-oriented implementations pave the way for more sophisticated processes. For instance, the simulation process has been enriched with enhanced definition of boundary interaction involving the internal adhesion. Mesh can now be generated out of the free surface of

the fluid at any timestep and new visualization modes further facilitate result comprehension.

For more details about the new software features, enhancements and corrections please, refer to the Release Notes document.

New Documentation

New Documentation in ANSA

Tutorials

- Assembly and model set-up with superelement welds
- Generating a PCB model and setting it up for analysis
- Modular set-up of a static simulation for Abaqus

Tutorials

- SPH simulation

New Documentation in META

User Guides

- Surface Polynomial Fitting Toolbar
- Damping Estimation Toolbar

New Documentation in KOMVOS

Tutorials

- Design and simulation of processes

Documentation in FATIQ

- Installation manual
- User Manual
- Theory manual

For more details about the new software features, enhancements and corrections please, refer to the Release Notes document.

Compatibility and Supported Platforms

ANSA files saved by all the first and second point releases of a major version are compatible to each other. New major versions can read files saved by previous ones but not vice versa.

META Project files saved from version 23.1.0 are compatible and can be opened by META version 16.0.0 or later.

Support for Windows 7 has been discontinued.
Support for Red Hat 6, and other Red Hat 6 compatible Linux distributions has been discontinued.
Support for Mac OS has been discontinued.
Support for 32-bit platform has been discontinued for all operating systems.

Download

Where to download from

Customers who are served directly by BETA CAE Systems, or its subsidiaries, may download the new software, examples and documentation from their account on our server. They can access their account through the "sign in" link at our web site.
Contact us if you miss your account details. The Downloads menu items give you access to the public downloads.
Customers who are served by a local business agent should contact the local support channel for software distribution details.

What to download

All files required for the installation of this version reside in the folders named **"BETA_CAE_Systems_v23.1.0"** and **"KOMVOS_v23.1.0"** and are dated as of **December 27, 2022**.These files should replace any pre-releases or other files downloaded prior to that date.
The distribution of this version of our pre- and post-processing suite is packaged in one, single, unified installation file, that invokes the respective installer and guides the procedure for the installation of the required components.

For the installation of the software on each platform type, download from the respective folders, the .sh file for Linux or the .msi file for Windows.

In addition to the above, optionally, the META Viewer is available to be downloaded for each supported platform.

The tutorials and the example files reside in the folder named "TUTORIALS". This folder includes the complete package of the tutorials and example files, and a package with only the updated ones.

The Abaqus libraries required for the post-processing of Abaqus .odb files are included in the installation package and can be optionally unpacked.

Earlier software releases are also available in the sub-directory called "Previous_Versions" or in a folder named after the product and version number.