

FrontISTR v5.6 Release Note

FrontISTR commons

FrontISTR v5.6 has been released!

FrontISTR v5.6

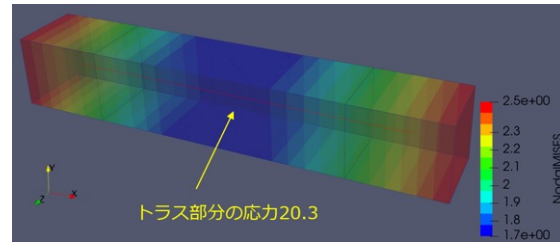
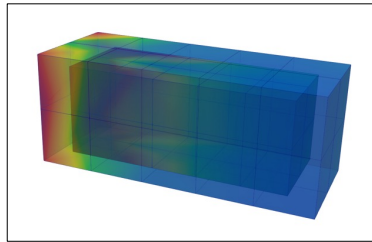
- Release date: May 24, 2024
- Changes from v5.5
 - Improvements: 9 issues
 - Specification changes: 5 issues
 - Bug fixes: 14 issues
 - Others: 10 issues



version	release date
Ver. 4.4	2015/02/17
Ver. 4.5	2016/07/22
Ver. 4.6	2017/09/14
Ver. 5.0	2019/10/18
Ver. 5.1	2020/06/30
Ver. 5.1.1	2020/11/13
Ver. 5.2	2021/04/09
Ver. 5.3	2021/11/11
Ver. 5.4	2022/07/08
Ver. 5.5	2023/02/24
Ver. 5.6	2024/05/24

Improvements (1/2)

- [#579](#) Enable direct methods with explicit master-slave elimination method for contact
 - MPC processing by explicit master-slave elimination method is available even when direct method is specified for the solver.
- [#599](#) Add function to embed element configuration nodes
 - Create "EMBED elements" where additional elements (node groups) are embedded in the geometry being analyzed
 - You can use by specifying !EMBED PAIR in the mesh file and !EMBED in the analysis control file
 - Sample model: FrontISTR/tests/analysis/static/embed_slag_iter



- Visualization of elemental equivalent plastic strain PL ESTRAIN
 - The equivalent plastic strain at the element center can be visualized by specifying PL ESTRAIN,ON in !OUTPUT_VIS
 - We will be implementing the details described in Issue [#583](#) in the future.

Improvements (2/2)

- [#582](#) Centrifugal force specification change (negative values allowed)
 - By setting the angular velocity of the centrifugal force to be negative, a radial compressive volume force can be loaded.
- [#243](#) Result output in case of face-to-face contact and MPC
 - Elements not in the mesh, which are generated internally in the case of face-to-face contact and MPC, are no longer output to the result files.

CI related

- [#564](#) Creating a manual on CI/CD
- [#535](#) Improve automatic generation of debian packages from a CI/CD perspective

Add tests

- [#463](#) Add tests for contact and MPC mixed models
- [#578](#) Add MPC tests
- [#543](#) Add tests using ML preconditioner for contact analysis

Specification changes

- [#294](#) Make it easier to change wrapper commands and command line options during test case execution
- [#35](#) Readability of `hecmw_result_add`
- [#433](#) Solve problems with large time history data files (BOUNDARY, DLOAD) and domain decomposition
- [#540](#) Refactoring of `solve_LINEQ_iter_contact`
- [#515](#) Allow AMPLITUDE to be defined in analysis control files as well

Bug fixes

- [#510](#) Sign of the tress term in the stress integral equation of updated Lagrange method
- [#321](#) Fix for elastoplastic analysis for geometric linear
- [#560](#) Incorrect download link for Ubuntu deb
- [#576](#) Bug of MPC with master-slave elimination when MPI parallelization
- [#577](#) Bug of contact and MPC mixed models with both using master-slave elimination when MPI parallelization
- [#588](#) Intent error in subroutine for smoothed 341
- [#226](#) Error loading ver.5 restart file on Windows version
- [#558](#) Error in missing hecmw_result_io_{bin|txt}.h at build
- [#537](#) Standard output messages of executables published in ver.5.5 remain ver.5.4
- [#462](#) rmerge fails with signal 11 when contact and MPC are mixed

CI related

- [#597](#) GitLab CI stuck in docker/fistr1
- [#545](#) Pipeline fails on branch with same status as master
- [#548](#) CI fails for hybrid execution
- [#547](#) Bug with docker container creation

Problem solving

- [#521](#) mpi-related tests fail on macOS PPC (all other pass)
- [#549](#) solid + shell model fails to solve
- [#552](#) Initial temperature does not affect the thermal steady-state analysis
- [#553](#) What is contact theory? What are the specific references?

Duplication or problems with past versions

- [#569](#) Version number of FrontISTR v5.5 remains 5.4
- [#598](#) Abnormally increased plastic strain in infinitesimal elastoplastic
- [#575](#) Contact pair names containing lowercase are not recognized correctly
- [#492](#) Investigation of integrating time increment control for dynamic and static analysis

Not necessary

- [#559](#) Consider the dependence of the coefficient of friction
- [#42](#) Add parallel partitioner

Acknowledgements

- Contributors

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FrontISTR_manual.git

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Bug reports

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- Count the number of commits merged into the release branch in the git repository (Merge commits are not counted)
- Command:
`git log --no-merges [previous release branch]..[this release branch] | grep -e Author | sort | uniq -c | sort -nr`
- Author name deviations are manually merged

Thank you very much for your cooperation!



FrontISTR

Large-scale Parallel Finite Element Analysis Open Software on HEC-MW

**Version 5.6 now
available**