FrontISTR v5.5 Release Note

FrontISTR commons

FrontISTR ver. 5.5 has been released!

FrontISTR v5.5

- Release date: Feb. 24, 2023
- Changes from ver. 5.4
  - Improvements : 11 issues
  - Specification changes: 3 issues
  - Bug fixes: 14 issues

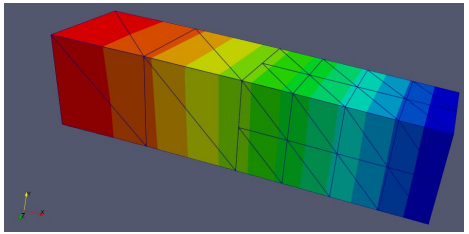
version	release date
Ver. 4.4	2015/02/17
Ver. 4.5	2016/07/22
Ver. 4.6	2017/09/14
Ver. 5.0	2019/10/18
Ver. 5.1	2020/06/30
Ver. 5.1.1	2020/11/13
Ver. 5.2	2021/4/9
Ver. 5.3	2021/11/11
Ver. 5.4	2022/07/08
Ver. 5.5	**2023/02/24**

Improvements

- #513 A new solver algorithm: SUP-GMRESR and GMRESR-EN
  - Available with GMRESR or GMRESREN in the !SOLVER,METHOD option

- #495 Smoothing element implementation
  - The analytical accuracy of tetrahedral first-order elements has been improved to that of hexahedral first-order Fbar elements with the same number of nodes.
  - Available when element formulation is specified with !SECTION, FORM341=SELECTIVE_ESNS
  - Sample model: FrontISTR/tests/lib/static_LIB_C3D4_selectiveESNS

- #92 Add TIE coupling constraints
  - The MPC constraint (TIE coupling) that joins two element surfaces can be generated internally from !CONTACT PAIR
  - This can be used by specifying !CONTACT, INTERACTION=TIED
  - Sample model: FrontISTR/tests/analysis/static/contact_slag_tied_iter



- #273 Combine eigenvalue values when outputting vtk for eigenanalysis

- CI related
  - #473 Create Ubuntu deb files with CI/CD
  - #224 Make CI create PDF manuals.
- Add test
  - #528 Add restart test for unsteady heat transfer analysis
  - #527 Add restart test for linear dynamic analysis
  - #524 Add a framework that can test restarts
  - #509 Add tests for Bbar, Fbar, and IC elements
  - #485 Clean up tests directory

Specification changes

- #496 Refactoring element functions and material functions
- #267 Make eigenvalue analysis generate an error when no density is defined
- #60 Replace unistd.h and dirent.h dependent functions (for windows)

Bugs fixed

- #526 Stresses do not match when restarting a dynamic analysis with 361 non-conforming elements.
- #525 Step time is reset to zero when restarting unsteady heat transfer analysis.
- #523 Fixed duplicate node removal in distributed parallel contact analysis.
- #508 Error with non-conforming elements
- #507 Fixed an out-of-area array reference error in 2D eigenvalue analysis
- #502 Total_mass calculation in mass_Shell for shell element mass matrix calculation
- #489 Stress zero in restart function for dynamic analysis.
- #488 Fixed bug that zeroing occurs when debug build is run without restart specified.
- #481 Fix thermal stress analysis using anisotropic elastic materials and isotropic coefficient of linear expansion did not calculate properly.
- #480 Fix typos in the hecmw1 subdirectory
- #468 Fix CMAKE FindScalapack
- #447 Make test fails in some cases with MPICH.
- #435 Number of BEAM_NQM output is different for element types "641" and "611".
- #34 Output of shell element visualization file

Acknowledgements

- **Contributors**

FrontISTR.git

Author	commits
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Noriyuki Kushida	8
Naoki MORITA	7
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Yu IHARA	3
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FrontISTR_manual.git

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Michio Ogawa	2
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Naoki MORITA	1

Bug reports

Author	commits
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T	

- 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!

Version 5.5 now available

2023/02/24