An introduction to the fcFSM module assembled in CUFSM

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Too long don't want to read version:

1. Run "batchcufsm5_fcFSM.m".

2. Done.

Full version:

A testing version of fcFSM is added into CUFSM as a module.

1. There is no modification to the current files of CUFSM.

2. Added items: a folder "%CUFSM folder% / analysis / fcFSM" [*] and two files in this folder - "stripmain_fcFSM.m" and "secAnal_fcFSM.m".

   To avoid modifications to the current file, "stripmain_fcFSM.m" is used instead of "stripmain.m" in this testing. There is no difference between these two files except for 3 short pieces of codes added in "stripmain_fcFSM.m".

   Most part of the construction process of fcFSM constraint matrices has nothing to do with half-wave length/member length, thus was placed in the "secAnal_fcFSM" function.

   *Note: "%CUFSM folder%" denotes the install directory of CUFSM, i.e. the directory where the file "cufsm5.m" locates.

3. This testing version of fcFSM runs in batch mode. The FSM models of examples are stored in the folder "%CUFSM folder% / examples / fcFSM_examples", and the launcher "batchcufsm5_fcFSM.m" locates in the folder "%CUFSM folder% / examples".

   So, this is the way to test your own example: (1) build the FSM model of your example, the nodes, elements, lengths, and so on, please refer to the illustrating examples; (2) specify the name of your example in "batchcufsm5_fcFSM.m", then run it.

4. The post-processing of this testing version is independent to the main GUI of CUFSM, but figures of modal decomposition and identification solutions are provided.

5. Further, the modal analysis solutions will also be saved as files and stored in the same directory of the FSM model data: the decomposition solutions "L - fcFSM.mat", "D - fcFSM.mat", and "G - fcFSM.mat", and the general solution with identification results: "general – Idt by fcFSM.mat".

   These fcFSM solution files can be opened within the main GUI of CUFSM. Especially, in the "Post-Processor" page, open them via "Load another solution" button, they can be compared to other solutions, and be examined in detail, e.g. buckling shapes of the fcFSM solutions.

6. What CUFSM model features are supported in this version of fcFSM?

   (a) End boundary conditions, e.g. S-C, C-G. Supported.

(b) Springs (all kinds of springs defined in CUFSM). Supported.

(c) Higher buckling modal analysis. Supported.

(d) Multiple longitudinal terms. Not supported. Will support this feature in the future versions.

(e) A longitudinal term not equal to 1 (e.g. m=3). Supported.

(f) Internal boundary conditions (on the nodes) and user defined constraints (equation constraints). Not supported. There will be a general fcFSM algorithm for arbitrary supporting conditions in the future.

(g) Quasi-curved cross-sections. Supported

(h) Curved corners. Supported