

DRAVVYA



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WHY Wildkatze Solver? Software Interaction

Following document explains some elements of Wildkatze solver that are very practical, useful and in contrast to other solvers.

Running Wildkatze Solver

Wildkatze is designed such that the large data is kept in different files than the other frequently needed information files.

For example when mesh is converted from other formats to Wildkatze's format, two files are written: **.bmesh** and **.info.bmesh**. Out of these two, **.bmesh** is binary data since it contains node coordinates, cell to cell connectivity etc. and **.info.bmesh** is a file that lists out the number of regions and their corresponding boundary names. This separation in two files is a very big advantage, since it saves much time when interacting with Wildkatze software.

Tip: user can change the names and types of the region/boundary in **.info.bmesh** file, using a simple text editor, before reading mesh in GUI to setup the simulation.

Also it is possible to simply edit the region/boundary names in **.info.bmesh** and use the same mesh with it. This feature is very practical for large mesh cases, where after a set-up change, saving would require some time. In this case we just need to edit **.info.bmesh** and use the same mesh for simulation

After setup is done user shall have three files:

- **.info.bmsh** > Mesh region information
- **.bmsh** > Heavy binary data
- **.stree** > Simulation set up tree structure

Using these three files user can run simulation in three modes:

Client-Server Mode

In this case user starts solver as server and then runs GUI as client. User can then connect the client and server running at the port at which server is running. User can set up the simulation here and then save `.stree` file to be run later.

Tip: User can use very coarse mesh to set up the simulation and then finally run the simulation with fine or larger mesh. This save lots of time for the user.

Console Mode

To run large simulations on computing clusters, user can run solver without GUI. Here Wildkatze command prompt is presented to the user, where he can change various options related to simulation or to the physics models. For more details, please consult [Text_User_Interface_Commands.pdf](#) from our web site.

Batch Mode

Batch mode is where simulation is run without GUI, in console mode and solver processes the commands presented in a text file.

Tip: User can set up one simulation file (.stree) and run it with various meshes in batch mode, just by changing the mesh name. This is very useful feature, when solver is used with **optimization programs**.

Restarting and Resuming the Simulation

It is required many times to save the simulation data and then resume the simulation. For this reason, the simulation data as various field variables (velocity, pressure, their gradients etc,) are exported to a restart file. This restart file could be ASCII or binary format.

Tip: Use ASCII format to load simulation data into simulation with different physics model. Use binary format for faster read and write of simulation data.

Since restart data is saved in different file, user can use the same .stree files for many different meshes. It also allows user to save the simulation set up in much less space compared to a setup file that contains also field variables.

Note: the restart files are saved as one single file, instead of N number of files for N processors. This means that running and restating the simulation can be done with any number of processes.

Auto-save

User can set up from GUI an auto save for restart file based on iteration or time frequency.

Changing Parameters

Once the simulation is setup as .stree file, user can change parameters by loading the simulation tree (.stree) file into GUI or by simply editing with a text editor.

Using text editor is very fast and it saves time when the simulation has very large meshes. One can also make copy of the simulation and just change parameters using a text editor. This saves lots of time when the same simulation has to be run with multiple settings.

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