Object-orientated concept for data input in the FE software RockFlow

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Extensive software programs can describe more and more complex processes by means of diverse numerical procedures. For the model definition and execution of the corresponding simulations, a large number of model parameters and other data are usually needed. The input concept for these user dependent information requires a well designed structure. It should be understood by the user and also support the developer.

In this contribution the concept for a text based, keyword orientated input model is presented. The documentation, input and output of keywords and parameters are unified within this structure. It consists of an object-orientated hierarchical tree, wherein all parameter sequences and their dependences are specified as leaf objects. Moreover additional information can be stored in the corresponding items. During the input process the tree structure reads the parameter sequences from file and saves the contents in the predefined data objects of the simulation model. Subsequently an output of the actually read parameters can be used for a accurate input control. A further output provides the presentation of all keywords and possible parameter sequences. These two variants support several formats, like ASCII, XML or LaTex. Whereas the LaTex-output provides a good basis for an always up-to-date user manual.

The input concept is implemented in the finite element software RockFlow, a tool used in research and development to perform simulations of fluid flow, mass and heat transfer as well as deformation processes in porous media. In combination with the graphical user interface (RockFlow GUI) information for a specific keyword and all possible parameter sequences can be easily retrieved using the xml-format.