InterFrost spread sheet for participant's code information

File is code related, if you use more than one code please provide one file per code …

Aims: 1°) provide pieces of information that will probably be essential to understand possible differences in the results or performances, 2°) provide info that will be essential to improve the codes from a "best practice" perspective.

Name of the code

DarcyTools

Participant laboratory

SKB-MFRDC

Participant name(s)

Is the code used or developed by the team?

YES

Numerical scheme, order of the numerical scheme

Hybrid Scheme, Second Order (First order at high Peclet numbers)

Time discretization strategy (fixed time steps / if adaptative, provide further information)

First order and Second order Euler time discretization, User control of time steps through coding of users function

Spatial discretization

- 2D / 3D 1D, 2D and 3D
- external/internal mesh generator External mesh generator developed by the Team
- structured or unstructured grids, what kind of polyhedral mesh (tetra ? hexa ?) Unstructured Adaptative Cartesian grids

Treatment of non-linearities?

- Method used (Newton, Picard …) Picard (iteration on equations during each time steps)
- Convergence criterion expression and threshold value Controlled by a maximum number of Picard iteration or by reduction of normalized residuals according to user's coding in users functions

Resolution of linear systems

- Linear solvers GMRES

- pre-conditioner Algebraic strongly coupled parallel multigrid (MIGAL)

How is the TH coupling managed?

- Sequential resolution / iterative process / simultaneous inversion? Iterative process in the Picard loop. Possibly strongly coupled (simultaneous inversion of pressure and temperature equation)

List of available boundary conditions options in the code Symmetry, Neuman and Dirichelt as well as any user boundary condition through source and sink terms programming in users functions

Sources of averaging (under relaxation, spatial averaging on variables …) Finite Volume

Constitutive laws implemented

- Saturation curve Linear and exponential + any user programmed function
- Permeability as a function of temperature user programmed function

What kind of averaging for the properties (depending on water, ice, bulk parameters)? Finite Volume

Is (massively)parallel resolution implemented? Not massively

- Which approach (domain decomposition, loop decomposition). Mixed domain decomposition (with user defined or automatic facility) and/or loop decomposition for flow; Loop decomposition for particle tracking.
- Indicative number of processors 64

Papers / reports / web site providing (further) information

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Further pieces of information?