The solution algorithm

- finite volume discretization on block–structured grid with arbitrary, hexagonal control volumes

- pressure–velocity coupling algorithm of SIMPLE kind with colocated arrangement of variables on numerical grid (FAN3D – Perić/Lilek, 1996)

Iterative solution procedure :

1. Converged solution of fluid flow field is calculated with $S_{u_i}^P = 0$.

2. Large number of discrete particles / droplets are traced through the flow field.

3. Source terms for the momentum exchange between phases are calculated.

4. Converged solution of fluid flow field is recalculated. Source terms due to momentum transfer between phases are taken into account. Appropriate underrelaxation factors have to be considered.

    - inner iterations for the solution of the linearized algebraic equations for one variable (Strongly Implicit Procedure (SIP) of Stone, ILU decomposition of coefficient matrix)

    - outer iterations for the non–linear coupling of the system of transport equations (pressure–velocity coupling, scalar quantities)

5. Convergence criterion is checked;

6. Steps 2 - 5 have to be repeated until convergence.

ASME Fluids Eng. Division Summer Meeting
A 3–dimensional Lagrangian Solver for Disperse Multiphase Flows on Geometrically Complex Flow Domains
Th. Frank, E. Wassen, Q. Yu, Technical University Chemnitz, Germany