NUMERICAL METHODS FOR FLUID-STRUCTURE INTERACTION

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ABSTRACT

In this minisymposium, we will provide a forum for discussing both discretization methods and coupling techniques for fluid-structure interaction. In this respect, we will consider both heat transfer and mechanical interactions. Topics addressed by the presentations will include:

- Cut-cell methods for the compressible and incompressible Navier-Stokes equations on collocated and staggered grids;
- Direct numerical simulation of the interaction of turbulent compressible flow with particles of Kolmogorov-length-scale size;
- Adaptive mesh refinement;
- Novel Runge-Kutta methods;
- Volume of fluid and level set methods;
- High order immersed boundary methods;
- Explicit fluid-structure coupling via kinematic and traction boundary conditions;
- Novel fluid-structure coupling of black box solvers and analytical models via the quasi Newton method.

REFERENCES

[1] Schneiders, L., Meinke, M., and Schröder, W. (2017). Direct particle–fluid simulation of Kolmogorov-length-scale size particles in decaying isotropic turbulence. *Journal of Fluid Mechanics, 819*, 188-227. https://doi.org/10.1017/jfm.2017.171