

# Heterogeneous domain decomposition for multiple scale problems

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High Reynolds flow in complex pipes and fluid-structure interaction are challenging problems that are common in blood flow simulation, and require fast parallel computing [2]. We will present in this paper some recent development on heterogeneous domain decomposition that lead to simple and robust parallel implementation [1]. We follow the Chimera approach combining boundary layer domains and regular domains for the main part of the flow. Thanks to the domain decomposition, we can catch the appropriate scales and keep the simplicity of topologically equivalent regular grids. Each sub-domain can be solved with a fast solver according to the asymptotic properties of the operator. This domain decomposition technique seems to be promising for fluid-structure interaction problems that are specific to complex blood flow in large arteries.

## References

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2. M. Garbey, M. Resch, Y. Vassilevski, B. Sander, D. Pless, T.R. Fleiter, Stent Graft Optimization in a Computer Grid simulation Environment (ref number 1238), 2nd Joint EMBS-BMES Conf. 2002.

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