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High-order simulation of flow around geometries on octree meshes using Brinkmann penalization. SABINE ROLLER, HARALD KLIMACH, NIKHIL ANAND, NEDA EBRAHIMI POUR, University of Siegen — Simulation of flow and acoustics over large domains and long distances require highly efficient CFD methods as well as highly scalable implementations on modern supercomputers. High-order Discontinous Galerkin (DG) implemented on octree meshes fulfill these requirements. Unfortunately, the representation of obstacles in the domain – which usually cause the generation of acoustics – is an issue for high-order methods. In combination with the high order DG (orders up to 32 or 64, i.e. >>2) the representation of the obstacle surface needs to hold an approximation order equivalent to the scheme order, otherwise the scheme looses its best property at exactly that point. This contribution will investigate the implementation of geometry representations with high-order on a given Cartesian mesh by using a Brinkmann penalization strategy.

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Sabine Roller
University of Siegen

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