

**MODEL ORDER REDUCTION USING A COLLOCATION SCHEME ON CHIMERA MESHES: ADDRESSING  
THE KOLMOGOROV N-WIDTH BARRIER**

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**Abstract**

In this talk, we propose a novel collocation-based Model Order Reduction (cMOR) strategy for solving parametric advection-diffusion PDEs on moving Chimera grids. Unlike traditional projection-based MOR, cMOR solves the High-Dimensional Model on a small subset of collocation points and extends the solution to the entire domain using a global reduced basis. By leveraging the ADER method on unsteady Chimera meshes, cMOR addresses the computational challenges posed by convective-dominated problems, particularly the Kolmogorov N-width barrier. Our results demonstrate the efficiency of cMOR in reducing the computational cost while maintaining accuracy.