11th World Congress on Computational Mechanics (WCCM XI)
5th European Conference on Computational Mechanics (ECCM V)
6th European Conference on Computational Fluid Dynamics (ECFD VI)
July 20–25, 2014, Barcelona, Spain

REDUCED COLLOCATION METHODS WITH PARAMETRIC PRECONDITIONING

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Key words: *Reduced basis method, Reduced collocation method, Spectral method, Preconditioning.*

In this talk, we present a reduced basis (RB) method well-suited for the collocation framework [1] together with parametric preconditioning techniques [2] for the resulting *reduced collocation method*. These works provide stable and efficient reduced basis strategies to practitioners who prefer a collocation, rather than Galerkin, approach. Two fundamentally different RB algorithms will be presented. One of these two algorithms eliminates a potentially costly online procedure that is needed for non-affine problems with Galerkin approach. The preconditioner can be parameter dependent and have the traditional affinity with respect to the parameters which allows for an offline-online decomposition. It improves the quality of the error estimation uniformly on the parameter domain, and speeds up the convergence of the reduced solution to the truth approximation significantly. Numerical results will also be presented to demonstrate the high efficiency and accuracy of these approaches.

REFERENCES

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