

A reduced basis method for parametrized variational inequalities applied to contact mechanics

Amina Benaceur, MIT

We investigate new developments of the Reduced-Basis (RB) method for parametrized optimization problems with nonlinear constraints. We propose a reduced-basis scheme in a saddlepoint form combined with the Empirical Interpolation Method to deal with the nonlinear constraint. In this setting, a primal reduced-basis is needed for the primal solution and a dual one is needed for the Lagrange multipliers. We suggest to construct the latter using a cone-projected greedy algorithm that conserves the non-negativity of the dual basis vectors. The reduction strategy is applied to elastic frictionless contact problems including the possibility of using non-matching meshes. The numerical examples confirm the efficiency of the reduction strategy.