

Efficient preconditioners for the solution of a Regularized Digital Image Correlation (RDIC) problem

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The digital image correlation (DIC) approach aims at computing the displacement field of a structure from two grayscale images. It is formalized as a minimization problem, whose linearization and discretization yield a sequence of symmetric positive definite linear systems, potentially of very large size in case of three-dimensional DIC. Preconditioned Krylov methods are a popular solution method when solving a sequence of large-scale linear systems of equations with symmetric positive definite matrices. The efficiency of such methods is strongly dependent on the spectral distribution of the preconditioned operator. In this talk we will present numerical experiments to compare the efficiency of different standard preconditioners in terms of memory requirements, complexity and computational time.