

The Collocation Trefftz Methods for Stokes Equations with Singularity

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Abstract

For the homogeneous Stokes equations in 2D, the boundary methods as in [2] are explored in this paper. The first issue is to seek the particular solutions satisfying the Stokes equations. The explicit fundamental solutions and particular solutions can be easily found for smooth solutions. However, the singular properties and particular solutions (PS) for the Stokes equations at corners are essential in both theory and computation. Our recent efforts have been devoted to a systematic study of linear elastostatics in corner and crack singularity. For model problems with interior crack, the corresponding numerical solutions are sought, and the experimental results are reported in [1, 3]. In this paper, a linkage of singular solutions between linear elastostatics and the Stokes equations is found, so that the singular properties and particular solutions for the Stokes equations at corners can be developed from [1, 3].

Keyword : Stokes equations, Singularity, Collocation Trefftz Method, Dirichlet Conditions