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AN AUGMENTED MIXED FINITE ELEMENT METHOD FOR LINEAR ELASTICITY WITH NON-HOMOGENEOUS DIRICHLET CONDITIONS*

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Abstract. We have recently developed a new augmented mixed finite element method for plane linear elasticity, which is based on the introduction of suitable Galerkin least-squares type terms. The corresponding analysis makes use of the first Korn inequality, and hence only null Dirichlet conditions, either on the whole boundary or on part of it, are considered. In the present paper we extend these results to the case of non-homogeneous Dirichlet boundary conditions. To this end, we incorporate additional consistent terms and then apply a slight extension of the classical Korn inequality. We show that the resulting augmented formulation and the associated Galerkin scheme are well posed. Finally, several numerical examples illustrating the good performance of the method are provided.

Key words. mixed-FEM, augmented formulation, linear elasticity

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