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STROH FORMALISM IN COMPUTATION OF THERMOMAGNETOELECTROELASTIC FUNDAMENTAL SOLUTIONS FOR 3D ANISOTROPIC SOLIDS

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Modern smart structures often incorporate materials, which can couple different fields, thus allowing energy transformation or serving as sensors and actuators. Thermomagnetoelectroelastic (TMEE) composites are those, which couple thermal, magnetic, electric and mechanical fields. They are widely used in smart structures, micro-electro-mechanical systems etc. This raises broad scientific attention to experimental and theoretical studies on the behavior of these multifield materials.

Particular theoretical interest is paid to the Green's functions, since the latter are the powerful tool in derivation of the solutions for complex problems by means of integral equation approaches. However, to the best of authors' knowledge there is only one publication concerning thermomagnetoelectroelastic Green's function in generally anisotropic solids [1]. The latter is obtained as a surface integral over a unit half-sphere. This study extends the analysis provided in [1] to reduce TMEE Green's to the double integral, which inner integral is evaluated explicitly using the complex variable calculus and the Stroh formalism. Thus, the Green's function is reduced to the contour integral. Since the latter is evaluated over the period of the integrand, the study proposes to use trapezoid rule for its numerical evaluation with exponential convergence. Several numerical examples are presented, which shows efficiency of the proposed approach for evaluation of Green's function in thermo-magnetoelectroelastic anisotropic solids.

1. *Pasternak I, Pasternak R, Sulym H.* A comprehensive study on Green's functions and boundary integral equations for 3D anisotropic thermomagnetoelectroelasticity. – Eng Anal Bound Elem. – 2016. – 64. – P. 222–229.

ФОРМАЛІЗМ СТРО В ОБЧИСЛЕННІ ФУНДАМЕНТАЛЬНИХ РОЗВ'ЯЗКІВ ТРИВИМІРНОЇ ТЕРМОМАГНІТО-ЕЛЕКТРОПРУЖНОСТІ АНІЗОТРОПНИХ ТІЛ

У роботі використано формалізм Стро і теорію функції комплексної змінної, що дало змогу звести тривимірну функцію Ґріна термомагнітоелектропружності до регулярного контурного інтеграла.