

PLANE STRAIN FOR THE MATERIAL WITH TRIPLE VOIDS

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In this talk the linear theory of elasticity for isotropic and homogeneous solids with macro-, meso- and microporosity is considered. In this theory the independent variables are the displacement vector field, the changes of the volume fractions of pore networks [1]. In the case of plane strain the general solution of the system of equilibrium equations is constructed explicitly by means of two analytic functions and three solutions of the Helmholtz equations [2, 3]. The boundary value problem is solved for a circle when the components of the stress tensor and the equilibrated stress vectors are given on the boundary.

References

1. Svanadze, M. On the linear equilibrium theory of elasticity for materials with triple voids. *The Quarterly Journal of Mechanics and Applied Mathematics*, **71**, 3 (2018), 329–348.
2. Muskhelishvili, N.I. *Some Basic Problems of the Mathematical Theory of Elasticity*. Noordhoff, Groningen, Holland, 1953.
3. Janjgava, R., Gulua, B., Tsotniashvili, S. Some Boundary Value Problems for a Micropolar Porous Elastic Body. *Arch. Mech.*, **72**, 6 (2020), 485-509.