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BOOK OF ABSTRACTS

MECHANICS OF COMPOSITE MATERIALS

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RIGA, LATVIA

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UNIVERSITY OF LATVIA

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Eds. V. Tamužs, K. Cīrule, A. Lagzdiņš

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Up to now, many investigations on the stress distribution in plates made from composite materials with a curved structure have been carried out. A detailed analysis of these investigations is given in [1]. However, in [1], only unidirectional curvings are considered. In the present paper, we assume that the curving is spatial and, for this case, the stress distribution in a rectangular plate is studied. The curving form is described by a specially selected function. The investigations are carried out within the framework of exact three-dimensional equations of the linear elasticity theory. In this case, the elasticity relations of the plate material are given by the Akbarov and Guz continuum theory [1]. It is assumed that the ends of the plate are clamped and uniformly distributed normal forces act on the upper face plane of the plate. Numerical results are obtained by employing the FEM. An analysis of these results shows that, owing to the spatiality of the curving, the self-balancing stresses increase. The impact of the local curving on these stresses is also investigated.

Reference

1. S. D. Akbarov and A. N. Guz', Mechanics of Curved Composites, Kluwer Academic Publish. 2000, 464 p.