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Solution for Thick Plate Resting on Winkler Foundation by Symplectic Geometry Method

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Abstract : Based on the symplectic geometry method, the theory of Hamilton system can be applied in the analysis of problem solved using the theory of elasticity and in the solution of elliptic partial differential equations. With this technique, this paper derives the theoretical solution for a thick rectangular plate with four free edges supported on a Winkler foundation by variable separation method. In this method, the governing equation of thick plate was first transformed into state equations in the Hamilton space. The theoretical solution of this problem was next obtained by applying the method of variable separation based on the Hamilton system. Compared with traditional theoretical solutions for rectangular plates, this method has the advantage of not having to assume the form of deflection functions in the solution process. Numerical examples are presented to verify the validity of the proposed solution method.

Keywords : symplectic geometry method, Winkler foundation, thick rectangular plate, variable separation method, Hamilton system
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