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Numerical solution for the elastic-large deflection behavior analysis of rectangular plates under combined loads and non-uniform lateral pressure using Galerkin method

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Summary

The aim of the present paper is to develop a semi-analytical method which and quickly and accurately compute the ultimate strength response of rectangular plates under combined loads and non-uniform lateral pressure. It is assumed that the plating is simply supported at four edges which are kept straight. A unique feature of developed method was found to give reasonably accurate results for practical design purpose in terms of the large deflection analysis of plates under non uniformed lateral pressure. The present paper treated by analytically solving the nonlinear governing differential equations of the elastic large deflection plate theory. It will be useful for the robust design of ship structures in association with bucking and ultimate strength of plates.