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ON ONE PROBLEM OF THE BENDING OF A PLATE
FOR A FINITE DOUBLY-CONNECTED DOMAIN
WITH A PARTIALLY UNKNOWN BOUNDARY

A problem of the bending of an isotropic elastic plate is studied for a finite doubly-connected domain bounded by two rectangles of common center whose vertices lie on the same beam drawn from the center. The vertices of the internal rectangle are cut out by convex smooth arc (the union of these arcs is shown for the unknown part of the boundary). It is assumed that each rectilinear segment of the boundary contours is supported by a rigid bar and the plate is bent by normal moments applied to the bars so that the rotation angles of the plate middle surface take piecewise-constant values.

The problem consists in determining the bending of the plate middle surface, as well as the analytic form of the unknown part of the boundary, where it is assumed that the tangential normal moment has a constant value.

Using the method of complex analysis, the solution of the posed problem is constructed effectively (in analytic form).