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TITLE: Postcritical state and stress concentration in flexible doubly connected plates

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TEXT: The author attempts to formulate the problem of postcritical elastic state for a plate with free inner boundary and fixed outer boundary. The differential equations of the problem are quoted and the boundary conditions formulated. The boundary loads are represented as sums of critical forces and additional postcritical loads. The stress function and the forces are accordingly represented as sums of three terms, the first two corresponding to the terms of boundary loads, the third being a correction term. Dimensionless stresses are introduced. The differential equations are solved by expansion in terms of a small parameter $\eta = \varepsilon/(1 + \varepsilon)$, ε being the smaller of the postcritical terms of normal and tan-

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gential boundary load, divided by the critical term of the normal boundary load. Differential equations and boundary conditions are given for the terms in η, η^2 and η^3. In the zero order approximation the deflection w_0 is equal to the eigenfunction corresponding to the minimal eigenvalue of the problem and multiplied by an arbitrary constant A. The solution of the first approximation w_1 exists only for determined values of A. The author deduces a non-linear equation which A must satisfy in order that w_1 may exist. The geometrical nonlinearity of the problem is defined as the difference between the stressed state of the inner boundary of the plate and that of the fictitious inner boundary of a simply connected plate. Taking this into account, the author analyzes the variation of the stress concentration factor, with a numerical example. There are 2 figures.

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