

Article Abstract

Title:	A parametric study on the growth of yield front in rotating annular disks
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Abstract:	The growth of elastic-plastic front under post-elastic conditions in high speed rotating annular disks having exponential and parabolic geometry variation is investigated in the present study. The problem is addressed in post-elastic regime through an extension of variational method based on von-Mises yield criterion and linear strain hardening material behavior. Assuming a series expression of the unknown variable, the solution of the governing equation is obtained using Galerkin's principle. The approximate solution is obtained using an iterative method. The von-Mises stress distribution in the disk is reported in waterfall plots at various load steps corresponding to angular speed at the initiation of yielding till the attainment of fully plastic state. Effect of geometry parameters on the stress state of the disk is studied and the relevant results are reported in dimensionless form.
Keywords:	Variational method, von-Mises stress, plastic front, limit angular speed, annular disk