

Semi analytical cum numerical analysis of two-dimensional elasticity problem of plate with eccentric hole in bipolar coordinate system

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### **Abstract**

A semi analytical cum numerical method for analyzing 2D elasticity problem of plate with eccentric hole in bipolar coordinate systems is given. Complete formulation of the plate problem is derived in bipolar coordinate system. A novel numerical integration technique is adopted to obtain the numerical results. Few parameters are identified that adversely affects the stresses and displacements of isotropic and FG plate with eccentric hole. Verification of the mathematical models with numerical results such as finite element models (COMSOL Multiphysics) and wide variety of applicability of the developed models for hypothetical/real field problems is seen from the present work.

**Keywords:** Solid Mechanics, 2Delasticity, Numerical Integration, Bipolar coordinate system, functionally graded