

**HEAT TRANSFER IN A FUNCTIONALLY GRADED ANNULAR FIN  
AND ITS EFFECT ON THERMAL STRESSES**

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**ABSTRACT**

The aim of the present work is to study the heat transfer and stresses induced in an annular fin made up of a functionally graded material (FGM). Unlike conventional materials, the thermo-mechanical properties in FGMs are varying with the spatial coordinates. Homotopy perturbation method (HPM) is employed to solve the steady state energy balance nonlinear differential equation of heat transfer. The closed form solution of stress field is obtained from the HPM solution of temperature field coupled with elasticity theory. The properties of the fin material are expressed as linear and power law distribution with radius. The effect of various thermal parameters on the temperature field, and subsequently stress field are presented and discussed. The results obtained from the present solution are compared with the numerical solutions and the results available in literature.