**Design And Analysis Of Rail Wheel**

**Abstract:**

Mechanics of the rail-wheel is one of the fundamental areas of the study in the railway engineering. Complicated geometries like rail-wheel problems are solved by using Finite element analysis software. In present years, loads on axle of railway cars increase because increased in transport of goods and faster infrastructural growth. The rail-wheels are subjected to high contact stresses of alternating magnitude. The rail-wheels are found to fail mainly due to fatigue under these loads. 3-D elastic frictional element model of the rail-wheel is helped to investigate effect of curve radius and super-elevation on contact stress. The present work is focused on the interaction between left and right wheels. The rail model includes 52 kg/m standard rail, sleeper, elastic rail clips, grooved rubber sole plate, SCGI insert, ballast bed. Fatigue analysis is done to calculate the life, damage, safety factor. Modal analysis is done to calculate the Modal shapes, natural frequencies. The results shows that curve radius and super-elevation have significantly effects on contact stress, life, damage, safety factor. And natural frequencies are obtained and the values are within the standard frequency range.

Key words: wheel-rail, superelevation, contact stress, Fatigue, Mode shape,