عنوان مقاله:

Wear modeling of new wheel profile in a closed loop, Sensitivity analysis due to velocity and track curvature

محل انتشار:

سومین کنفرانس بین المللی پیشرفتهای اخیر در مهندسی راه آهن (سال: 1392)

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خلاصه مقاله:

Wheels and rails are under the most severely loadings. Understanding of rolling contact in presence of dry friction is very complicated phenomenon. Nevertheless, the practical problems in this field including wear, rolling contact fatigue and dynamical performance has been solved by engineering genius and scientists investigations. Systematic investigations around metal on metal sliding/rolling contact have showed that the dissipated energy and contact forces are two important factors affecting wheel and rail wear. However the problem of estimating these guidelines is a great challenge. For this purpose non-linear dynamical models and simulating operational conditions have been developed. These results inputs for calculation of wheel and rail wear, so the required dynamical model should predict wheel-rail interaction with high accuracy. In this paper by employing multi body dynamics (MBD), an Open-Wagon equipped with three pieces bogies considering non-linear affects of wedges and structural clearances have been modeled in Universal Mechanism software. Analyses have been performed on closed loop track with tangent and curved sections considering vertical and lateral random irregularities. Simulation results are used to calculate friction work, wheel wear depth and worn wheel profiles for different velocities and radiuses. Specht model based on Archard's Theory is used for wear calculations. Finally wear depth of outer wheels are studied to determine the affect of velocity, track curvature and Pivot friction of bogie on the wear pattern of wheels. The results show that Pivot friction has a great affect on non-uniform wear of wheels even in short distances and friction work is found to be dependant on velocity.

کلمات کلیدی:

Freight trains, three pieces bogies, Specht wear theory, wear depth, friction work

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