

A Study on the Wheel-rail Impact Behavior due to a Wheel-flat by Finite Element Analysis

Risa SAITO Hirotaka SAKAI

We simulated the continuous impact force due to a wheel-flat using the finite element method to investigate the influence of running velocity and positions of the impact force generation on the rail on the mechanism of impact force generation. For each position of the impact force generation on the rail pad, the peak values of the wheel load are almost identical, confirming the reproducibility. It was also found that high frequency vibrations are generated on the rail when the running velocity is 100 km/h or 130 km/h and the vibrations caused the peak value of the wheel load to increase. Finally, the relationship between the running velocity and the peak value of vertical acceleration of the axlebox by the proposed method was compared with that obtained from the experiment. Since they were close, we can say that the proposed analysis method is reasonable to use.