

A Simple Analysis Model for Contact between Car Bodies and Structures Using Multi Body Dynamics

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In this study, we have constructed an efficient contact model to express collision phenomenon between the car and the structures during an earthquake. Specifically, we define contact detection points on multi-body vehicle model and define the contact surface on structures modeled by FEM. The dynamic interaction force is calculated by the penalty method. In addition, we have incorporated the model into the numerical analytical program DIA-STARS III that is able to express the railway vehicle behavior before and after derailment. Finally, to validate the practicability of the proposed model, we have conducted the analysis of the behavior of the car body contacting with the structures after derailment during earthquake.