

**Numerical Analysis of Improvement of Curving Performance of a Vehicle
by Providing Wheel Tread Profile with Fine Unevenness**

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In this paper, the author proposed a method to introduce fine unevenness on a part of a wheel tread in order to improve curving performance of railway vehicle without decreasing its hunting stability, and verified the validity of this proposed method by executing a numerical analysis. In our past researches, we investigated the tangential force for each case with/without fine unevenness on the contact surface of the wheel tread, and showed that creep force for the case with fine unevenness was small compared with the case without fine unevenness. When a railway vehicle runs on a curved section, a contact point of inner wheel/rail shifts to the side other than the flange. At this time, if the creep force of an inner rail side becomes small due to the fine unevenness in the wheel tread, the lateral force of outer rail can decrease, and thus the vehicle can the curve more smoothly. We showed by numerical analysis that the wheel tread with fine unevenness has a large reduction effect of outer lateral force and derailment coefficient especially in cases where vehicles run on a sharp curve with a large cant at a low speed.