Alteration of Turned Wheel's Surface Condition and Effectiveness of Lubrication against Flange Climb Derailment

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There have occurred a number of flange climb derailments on sharp curves such as those of turnouts in a relatively short running distance after wheel turning. It indicates that the alteration of turned wheel's surface condition might be related to induction of flange climbing. Through several experiments and numerical simulations, the authors have investigated the relationship between running safety of vehicle and wheel's surface condition especially in terms of friction between wheel and rail. Furthermore, lubrication just after the wheel turning has been proposed as a countermeasure against flange climb derailments and its effectiveness and persistence have been evaluated.