Influence of Wheel Turning Trace on Wheel/Rail Tangential Contact Force Characteristics under Running in Rainy Conditions

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A wheel tread has wheel turning traces like grooves on a rubber tire tread. In the case of such a tread, the friction force of wheel/rail in wet conditions was expected to increase as was that of tire/road. Therefore, to clarify the relationship between wheel turning traces and friction force, tangential contact force measurements using a twin-disk rolling machine were carried out in several wet conditions. As a result, it was clarified that the friction force is almost unchanged regardless of the existence of wheel turning traces due to high iron's stiffness and that, especially under low velocity conditions, the friction force with wheel turning traces is smaller compared with that without wheel turning traces due to a small contact-patch. This means that the combination of wheel/rail is different from that of tire/road in terms of tangential force characteristics.