Slip Suppressing Control Method Using Information of Traction Motor Current of EMUs Driven by Multiple Traction Motors Without Speed Sensor

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As for the Electric Multiple Unit (EMU), the system to drive multi traciton motors (induction motors) by one inverter is generally adoped. Nowadays, the traciton motors control method without speed sensor is widely used.

This paper describes the development of a traction motor control method which could suppress a wheel-slip by detecting it earlier and with smaller amount of torque drop than the conventional method, by focusing the amplitude difference between each traction motor current vector (current difference), for EMUs driven by the parallel-connected two traction motors without speed sensor installed in the bogie.

To verify the effectiveness of the developed control method, we performed the running test with water sprayed using a test EMU. As a result, the average EMU train acceleration in the running direction was increased by more than 5%, the number of the slip detection by acceleration was reduced by half, and the ride comfort was improved.