FSM1S_12586

XXI International Congress of Theoretical and Applied Mechanics
Warsaw, Poland, August 15–21, 2004

Measurements and Calculations Related to Curve Squealing in the Railway System

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Within a collaboration between the Swiss Federal Institute of Technology (ETH) and the Swiss Federal Railways (SBB), the phenomenon of curve squealing is studied. The aim is to understand the phenomenon causing the noise. Therefore various measurements and studies have been done. These include long-term-measurements on regular railway traffic, test runs with a test train, lab tests and simulations. Long-term-measurements gave first inputs of the critical weather conditions and critical vehicles. Test runs with the test train gave information about running behaviour depending on train speed and moisture on rail and the resulting wheel displacement and striking angle between wheel and rail. In the same time acoustic measurements allowed to establish which wheel squealed while passing by the microphones. Lab tests and simulations were used to characterize the behaviour of the train wheel depending on its decreasing diameter due to wear. Results are presented in the paper.

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