

Application of continuous wavelet transform in detection of the wheel-flats

**Tomasz Nowakowski, Pawel Komorski, Grzegorz M. Szymanski,
Franciszek Tomaszewski**

Abstract: The increasing vibroacoustic level is a noticeable problem in large Polish and European cities. It depends directly on public rail transport development. Number of inhabitants and passengers complain on annoyance vibroacoustic signals emitted by light rail vehicles during passage rise up. Moreover the problem is noticed by cities authorities and public transportation operators. Thus, it is important to maintain the quality of the cooperation of vehicles and track, which revolves around the wheel-rail contact area. One of the main causes for increased vehicle-dependent dynamic impacts at the wheel-rail contact area are irregularities on the rolling surface of the wheels (e.g. wheel-flats). The main goal of the paper is application of the continuous wavelet transform in detection of the wheel-flats. The experimental rail vibration measurements during passing by several light rail vehicles were carried on. There is a possibility of implementation the continuous wavelet transform algorithms in the vibration analysis for the effective wheel-flats detection system.

-
- 1) Tomasz Nowakowski, M.Sc. (Ph.D. student): Poznań University of Technology, Divison of Rail Vehicle, Piotrowo 3, Poland (PL), tomasz.zb.nowakowski@doctorate.put.poznan.pl, the author presented this contribution at the conference in the special session "Modeling and experiments of complex continuous systems" organized by F. Pellicano and A. Zippo
 - 2) Pawel Komorski, M.Sc. (Ph.D. student): Poznań University of Technology, Divison of Rail Vehicle, Piotrowo 3, Poland (PL), pawel.komorski@put.poznan.pl.
 - 3) Grzegorz M. Szymanski, Associate Professor: Poznań University of Technology, Divison of Rail Vehicle, Piotrowo 3, Poland (PL), grzegorz.m.szymanski@put.poznan.pl.
 - 4) Franciszek Tomaszewski, Professor: Poznań University of Technology, Divison of Rail Vehicle, Piotrowo 3, Poland (PL), franciszek.tomaszewski@put.poznan.pl.