Politechnika Warszawska

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CENTRE VAL DE LOIRE

26 SEMINAIRE FRANCO POLONAIS de MECANIQUE

26 Polsko Francuskie Seminarium Mechaniki
oraz
10 Konferencja „Tarcie -2018"

26eme Séminaire Franco-Polonais en Mécanique et 10eme Int. Conference „Frottement 2018"

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ET LE COMMITTEE DE CONSTRUCTION DES MACHINES DE L'ACADEMIE DES SCIENCES POLONAIS

Madames, Monsieurs,

Nous avons le plaisir de vous inviter au

26$^{-ème}$ Séminaire Franco-Polonais de Mécanique

ainsi que celle de la

10$^{-ème}$ Internationale Conférence

„Modélisation et Simulation des Phénomènes de Frottement dans les systèmes Physiques et Structures Techniques„–"Frottement 2018"

Ces manifestations se tiendront respectivement

le 14 mai 2018 (lundi) et le 15 mai 2018 (mardi)

Bâtiment de la Faculté des Véhicules et des Machines Lourds

de l'École Polytechnique de Varsovie, 84, Rue Narbutta

Motor current signature analysis for railway driving system condition monitoring

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Abstract

Drive systems are one of the key components in railway vehicles. The need of an easy and effective monitoring and diagnosis technique has led to the increasing use of motor current signature analysis. Wheelsets, bearing and toothed gear faults in the railway drive system run by an induction motor causes change in its stator current spectrum. The above-mentioned defects in the electric drives cause variations of load irregularities in the magnetic field which in turn change the mutual and self-inductance causing side bands across the line frequency. Results of this analysis presented in the paper are used in order to investigate the drive system's sensitivity to torsional oscillations. Here, the dynamic electromechanical interaction between the electric driving motor and the rotating wheelset is considered. The main objective of this paper is shown influence such faults in the railway drive system on motor current signature. Fast Fourier Transform (FFT) is initially employed for a first comparison between a healthy and a defective system. In the next step, wavelet analysis is used. Base wavelet has been selected on the basis of wavelet selection criteria - Maximum Relative wavelet energy. Additional this investigation has proved that the torsional stiffness and damping of drivetrain system strongly affect amplitudes of the self-excited vibrations which effects on motor current signatures of induction motor. Conclusions drawn from the computational results can be very useful during a design phase of diagnostic and monitoring devices as well as helpful for their users during a regular operation and maintenance.