Dynamics of a railway vehicle on a laterally disturbed track

In this article a theoretical investigation of the dynamics of a railway bogie running on a tangent track with a periodic disturbance of the lateral track geometry is presented. The dynamics is computed for two values of the speed of the vehicle in combination with different values of the wavelength and amplitude of the disturbance. Depending on the combinations of the speed, the wavelength and the amplitude, straight line forward motion, different modes of symmetric or asymmetric periodic oscillations or aperiodic motions, which are presumably chaotic, are found. Statistical methods are applied for the investigation. In the case of sinusoidal oscillations they provide information about the phase shift between the different variables and the amplitudes of the oscillations. In the case of an aperiodic motion the statistical measures indicate some non-smooth transitions.

General information
Publication status: Published
Organisations: Department of Applied Mathematics and Computer Science, Dynamical Systems
Contributors: Christiansen, L. E., True, H.
Number of pages: 32
Pages: 1-32
Publication date: 2017
Peer-reviewed: Yes

Publication information
Journal: Vehicle System Dynamics
ISSN (Print): 0042-3114
Ratings:
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 2.86 SJR 1.17 SNIP 2.05
Web of Science (2017): Impact factor 2.406
Web of Science (2017): Indexed yes
Original language: English
Keywords: Vehicle dynamics, Nonlinear dynamics, Track irregularities
DOIs:
10.1080/00423114.2017.1372584
Source: FindIt
Source-ID: 2390181112
Research output: Contribution to journal › Journal article – Annual report year: 2017 › Research › peer-review