As a conclusion it should be noticed that application of low magnetic field leads to the changes of structure and properties of metal and biological samples and for biological objects such changes often dramatically influencing the way of organism functioning.

References

1. Wertheimer N. Electrical wiring configurations and childhood cancer / N. Wertheimer, E. Leeper // American Journal of Epidemiology. – 1979. – V. 109, N 3. – pp. 273 – 284.
2. Friedman J. Mechanism of short-term ERK activation by electromagnetic fields at mobile phone frequencies/ J. Friedman, S. Kraus, Y. Hauptman, Y. Schiff, R. Seger // Biochem. J. – 2007. – V. 405. – pp. 559-568.
3. Adair R.K. Constraints on Biological Effects of Weak Extremely Low Frequency Electromagnetic Fields / R.K. Adair // Phys. Rev. – 1991. – V. A 43. – pp. 1039-1048.
4. Moulder J.E. Power-frequency Fields and Cancer/ J.E. Moulder // Crit. Rev. Biomed. Eng. – 1998. – V. 26. – pp.1-116.
5. Kudo Kozo Effect of an external magnetic flux on antitumor antibiotic neocarzinostatin yield by Streptomyces carzinostaticus var. F–41 / Kudo Kozo, Yoshida Yuko, Yoshimura Noboru, Ishida Nakao // Jap. J. Appl. Phys. Pt. 1. – 1993. –V. 32, Iss. D 11 A. – pp. 5180–5183.
6. Gretz M.R. Cellulose biogenesis in bacteria and higher plants is disrupted by magnetic fields / M.R. Gretz // Naturwissenschaften. – 1989. – V. 76, Iss. D 8.– pp. 380–383.
7. Niehaus M. Growth retardation, testicular stimulation, and increased melatonin synthesis by weak magnetic fields in djungarian hamster, Phodopus sungorus / M. Niehaus, H. Bruggemeyer, M. Behre Hermann, A. Lerchl // Biochem. and Biophys. Res. Commun. – 1997. – V. 234, Iss. D 3. –pp. 707–711.
8. Burchard J. F. Biological effects of electric and magnetic fields on productivity of dairy cows / J. F. Burchard, D. H. Nguyen, L. Richard, E. Block // J. Dairy Sei. – 1996. – V. 79. – pp. 1549-1554.
9. Prato F.S. Modulatory action of light on the behavioral responses to magnetic fields by land snail probably occur at the magnetic field detection stage / F.S. Prato, M. Kavaliers, A.W. Thomas, K.-P. Ossenkopp // Proc. R. Soc. London. – 1998. –V. 265, N. 1394. – pp. 367-373.
10. Blank M. Electromagnetic initiation of transcription at specific DNA sites / M. Blank, R. Goodman // J. Cellular Biochemistry. – 2001. –V. 81, N 4. – pp. 689–692.
11. Koyama S. Combined exposure of ELF magnetic fields and x-rays increased mutant yields compared with x-rays alone in pTN89 plasmids / S. Koyama, T. Nakahara, T. Sakurai, Y. Komatsubara, Y. Isozumi, J. Miyakoshi // J. Radiat. Res. – 2005. – V. 46, N 2. – pp. 257–264.
12. Qin C. Effects on rats of low intensity and frequency electromagnetic field stimulation on thoracic spinal neurons receiving noxious cardiac and esophageal inputs / C. Qin, J.M. Evans, W.S. Yamanashi, B.J. Scherlag, R.D. Foreman // Neuromodulation. – 2005. –V. 8, N 2. – pp. 79–85.

MODELING OF PROCESSES OF MECHANICAL INTERACTION IN DISCRETE-CONTINUUM COMPLEX "TRAM -TRACK OVERHEAD STRUCTURE"

LUDMILA GUDZLOVENKO, post-graduate student
O.M.Beketov National University of Urban Economy in Kharkiv

The paper investigates the interaction of the tram to the rail in the area of isolated irregularities butt. Considered the transport of the complex mechanical "train

track at the site of butt irregularities”. The dependences of the deflections of the receiving rail track sleepers under the third phase of their growth from the operating and structural parameters of the rolling stock and the track structure.

The service life of rolling stock and rail tracks is a function of teamwork rolling stock and rail tracks, mechanical, structural and geometric characteristics of the rolling stock and track overhead structure, conditions of their operation. Practice shows that the weakest link of the mechanical system "car - rail track" is the butt irregularities of the rail – is rail joints.

Components and units are influenced by dynamic forces of interaction between cars and track overhead structure, which in their turn, vary both in time and direction and have the shock and the probable nature of the motion of the wagon. The variable stability along the length of the upper track structure and uneven in length accumulation of residual strain in it causes inequality rails. Research shows that most ballast layer deposition occurs in places of butt inequalities under the receiving rail sleepers. This is due to the fact that in these places rail usually suffers from the most dynamic loading of shock type.

To determine the deflections of the receiving rail under the first sleeper the method of dynamic analysis is applied, which includes the step of height calculation butt irregularities in the mode of static load of giving and receiving rail track considering the phases of wagon movement (passing the junction of corresponding wheel pair) and stage of deflections’ dynamic analysis of the receiving rail under first sleeper.

When the stringers of rail are statically calculated they use the model of numerous stringers beam based on 23 elastic support (22 sleepers and resting on the next rail through working pad). That allows you to define the parameters of rail’s resting considering the rigidity of connection. The stringers of giving and receiving rails are analyzed taking into consideration the corresponding phase of wagon movement. The stringers of the receiving rail track under the first sleepers as a result of the shock dynamic wagon interaction with the receiving rail in the butt area are considered on the basis of operating and design parameters of a tram: loading of the wagon, the rate in the butt area (the prehit rate), consolidated mass of car wheels, the speed of its center of mass, the length of the butt.

The shock interaction in discrete-continuous mechanical complex “wagon-wheel pair –rail track” was investigated on the base of a dynamic model that takes into account the energy dissipation in the rail support and the angle of its shear cut.

The actual coordinate of wheels is taken into account, which determines the current linear wheel position along the rail in terms of their joint mechanical interaction.

In practice, the obtained results are used to study the parameters of the first sleeper elastic sinking of the receiving rail for various types of interaction and boundary conditions of its fixing. On their basis they solve the task of the influence of mechanical and structural parameters of the tram on the spans of the giving and receiving rails.