SUMMARIES

IMPACT OF LONG TRAINS ON THE RAILWAY TRACK. **M. Chaladze, M. Papaskiri, N. Kvachadze, G. Chaladze, G. Gelenidze.** "Problems of Mechanics", Tbilisi, 2024,   1(92), pp. 21-25, (Engl.).

An aspect of developing railway transport is increasing the load bearing capacity of railway tracks. One way to accomplish this objective involves the implementation of long-length trains. However, such endeavors are accompanied by inherent technical challenges concerning the increase of train dimensions in weight as well as length. Within this study, we undertake a comprehensive analysis to calculate the forces crucial to the stability of both track and rolling stock. 2 ill. Bibl. 3. Engl., sum.in Russian.

ELECTRICAL CENTRALIZATION IN TRANSPORT MODULES. **M. Chaladze.** "Problems of Mechanics", Tbilisi, 2024,   1(92), pp. 26-32, (Engl.).

Electrical Centralization in Transportable Modules (ECTM) represents a modern solution tailored for railway infrastructure in temperate climates. This innovative system offers a flexible and efficient approach to managing railway stations, particularly suitable for dispatch control and temporary station control needs.

ECTM modules are designed to be portable, allowing for easy installation and relocation as operational requirements evolve. This mobility feature enhances the system's adaptability, making it ideal for dynamic railway environments. The modules incorporate advanced electrical components and systems, ensuring reliable performance even in challenging weather conditions common to temperate climates. 3 ill. Table 2. Bibl. 4. Engl., sum.in Russian.

FERRITE-BASED ABSORBERS FOR BROADBAND MICROWAVE RANGE REVIEW. **G. Mushkudiani.** "Problems of Mechanics", Tbilisi, 2024,   1(92), pp. 33-43, (Engl.).

Materials absorbing electromagnetic waves of the radio frequency range containing different types of ferrites are discussed. Their main characteristics are shown. The principle of action and the theoretical basis for the selection of characteristics are described. Comparative analysis shows that

graphene and $Ni_{0.6}Cd_{0.4}Fe_2O_4$ nanocomposite ferrites have interesting characteristics for the studies. 4 ill. Table 1. Bibl. 15. Engl., sum. sum.in Russian.

METHOD OF CALCULATING OF FORCES AT THE RADIAL REDUCTION AXIS SUMMETRICAL WORKPIECES. **T. Natriashvili, S. Mebonia, O. Mikadze.** "Problems of Mechanics", Tbilisi, 2024,   1(92), pp. 44-53, (Engl.).

A new design of a radial reduction device with a hydromechanical wire mechanismis proposed. A method for calculating the forces acting on the tool in the process of radial reduction in the cold state of axisymmetric workpieces is given. It has been established that the total force in the steady process of radial compression is determined by the summation of the elementary forces acting in the zones of the deformation zone. The analysis of the obtained calculation formula showed that the value of the total radial compression force depends on the dimensions and material of the workpiece, the type of lubricant and the coefficient of friction in the deformation zone. 3 ill. Bibl. 10. Engl., sum. In Russian.

NON-STEADY FLOW OF CONDUCTING LIQUID UNDER DISTINCT OUTER MAGNETIC FIELD. **V. Tsutskiridze, M. Tsutskiridze.** "Problems of Mechanics". Tbilisi, 2024, 1(92), pp. 54-60, (Engl.).

Exact solutions of non-stationary tasks are obtained for fully developed flow of conducting liquid in the direction of the ax x through distinct outer magnetic field $\vec{B}^e = \{0, \quad -B_0 y/a, \quad B_0 z/a\}$ for semi--space and flat tube urder the condition of equality of magnetic and kinetic viscosity. In case of semi-space solution is expressed through the integral of propability. Bibl. 9. Engl., sum. In Russian.

SOME TASKS OF MATHEMATICAL MODELING OF ELECTROMAGNETIC VIBRATORS **M. Chelidze, T. Natriashvili, S. Chagelishvili.** "Problems of Mechanics", Tbilisi, 2024,   1(92), pp. 61-70, (Engl.).

The article deals with the problems of mathematical modeling of nonlinear electromagnetic vibrators. Based on the mathematical analysis of differential equations describing the oscillatory

motion of electromagnetic vibration exciters, the reasons for the incorrect physical and mathematical description of the action of a semiconductor diode in the vibrator power circuit are shown. Unfortunately, some articles incorrectly give ways to overcome them. On the basis of mathematical experiments, it is shown that, with great success, the dynamics of an electromagnetic vibration exciter can be described instead of two differential equations by one differential equation. A method is shown that facilitates obtaining the amplitude-frequency characteristics of nonlinear systems in mathematical modeling. 13 ill. Bibl.12. Engl., sum. In Russian.

DEVELOPMENT AND EXPERIMENTAL STUDY OF NEW DESIGN OF THE UNIVERSAL DEVICE FOR VIBRO—SEPARATION OF FRIABLE MATERIALS. **V. Zviadauri, M. Chelidze, T. Nadiradze.** "Problems of Mechanics", Tbilisi, 2024,   1(92), pp. 71-81, (Engl.).

One of the important problems of vibratory separation of non-homogeneous friable materials consists in separation of their particles with binding properties (stickiness, viscosity) and further sieving. A similar problem arises at release and metering feeding of materials with the noted properties from the bunker. In the paper are presented some results of the physical experiments on penetration of vibrations in the soil; an universal device for separation "vibrating bunker – water spraying system – vibro-feeder with a net on the working member – water ambiance (a tub with water)" developed by us, providing release of finely dispersed friable materials with binding properties from the bunker, their metering feeding on the working member and sieving (separation) in the water ambiance on the vibrating bottom with a net. Depending on the type and state of the friable material (dry, wet etc.), the device can operate in both cases – with and without water ambiance. A physical sample of the device was fabricated and the experiments were carried out on it for some materials, including finely dispersed iron powder. Materials depicting results of the experiments are presented. 14 ill. Bibl.12. Engl., sum. In Russian.

BERNOULLI'S EQUATION AND ITS ENERGETIC ESSENCE. **R. Kenkishvili, S. Sabashvili.** "Problems of Mechanics", Tbilisi, 2024,   1(92), pp. 82-88, (Engl.).

In this article is given an attempt to consider the Bernoulli's equation, formulated in 1738 to reduce the equation members to the energetic units which are more comfortable in practical calculations, than application of different physical values. For instance, it is known that unit of pressure is pascal which shows how much force acts in the 1 m^2, i.e. *P=F/S*. Multiplying a nominator and denominator by 1 m we obtain joule/m3; by such way there can be reduced all physical values incoming in the Bernoulli's equation, we will obtain the best way to solve the complicated physical problems. 3 ill. Bibl. 3. Engl., sum.in Russian.