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# KAYSERI

*scientific research and innovation congress*

MAY 30-31, 2026 | KAYSERI, TÜRKİYE

PROCEEDINGS  
BOOK

EDITOR  
Dr. Fatma Gül SAKLAVÇI





**ISARC**

INTERNATIONAL SCIENCE AND ART RESEARCH CENTER

***INTERNATIONAL KAYSERI SCIENTIFIC  
RESEARCH AND INNOVATION  
CONGRESS***

*May 30-31, 2026 / Kayseri, Türkiye*

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IKSAD Publications – 2026©  
Issued: 20.06.2026

**ISBN: 978-625-378-665-6**

# CONTENT

CONGRESS ID	I
SCIENTIFIC & REVIEW COMMITTEE	II
PHOTO GALLERY	III
PROGRAM	IV
CONTENT	V

## ABSTRACTS

Author	Title	No
Hasan Can	THE LEGAL NATURE OF THE GUARANTEE IN BILLS OF EXCHANGE: A SUI GENERIS OBLIGATION TRANSCENDING THE DILEMMA OF INDEPENDENCE VERSUS ACCESSORY NATURE	1
Ramazan COŞKUN	AN EXAMINATION OF FAILURE DYNAMICS IN STARTUPS FROM A SUSTAINABILITY PERSPECTIVE	3
Yusuf SÜVE Alis KOSTANOGLU GÖKHAN CAN TÖRPÜ	COMPARISON OF THE EFFECTS OF ONLINE-BASED TELEREHABILITATION AND EDUCATIONAL MATERIAL SUPPORTED EXERCISE APPLICATIONS ON PAIN, SLEEP QUALITY, KINESIOPHOBIA, AND QUALITY OF LIFE IN OFFICE WORKERS WITH NON-SPECIFIC NECK PAIN	5
Buse Nur MADEN Rabia ÇAKIR Saliha Ece ACUNER	INVESTIGATION OF THE ROLE OF OXIDATIVE STRESS IN PARKINSON'S DISEASE USING TRANSCRIPTOMIC ANALYSES AND IDENTIFICATION OF POTENTIAL INHIBITORS THROUGH COMPUTATIONAL DRUG DISCOVERY APPROACHES	7
Selin YILDIZ Gonca KEÇECİ	AN EVALUATION OF THE STEAM PLATFORM DEVELOPED FOR MIDDLE SCHOOL STUDENTS AND SCIENCE TEACHERS, BASED ON THE EXPERIENCES OF MIDDLE SCHOOL STUDENTS	9
Nejdet ÇELİK	RECONSTRUCTING THE CONCEPT OF FAMILY: THE TURKEY CENTURY EDUCATION MODEL AND THE 2024 SOCIAL STUDIES CURRICULUM	11
Esra KARABACAK Selma KORKMAZ Pembe Eminsel ÇETİN	EVALUATION OF TEACHERS' OPINIONS ON THE ANALYTICAL METHOD USED IN PRIMARY READING AND WRITING INSTRUCTION	13
Pembe Eminsel ÇETİN Selma KORKMAZ Esra KARABACAK	EVALUATION OF VISUAL READING SKILLS OF ELEMENTARY SCHOOL TEACHERS	15
Fatma TEKİN Asena Ayvaz CAN	AN EXAMINATION OF THE MEANINGS ATTRIBUTED TO FRIENDSHIP BY FOURTH-GRADE ELEMENTARY SCHOOL STUDENTS	17
Veysel Hasan GÜL Cemre ERTEN TATLI	THE MEDIATING ROLE OF HOUSEHOLD CHAOS IN THE RELATIONSHIP BETWEEN FAMILY FUNCTIONING AND EXECUTIVE FUNCTIONS IN UNIVERSITY STUDENTS	19
Ayşenur YILDIZ Dilay ÖĞÜT Sevinç TAY	EFFECTS OF ARONIA CONSUMPTION ON ANTIOXIDANT CAPACITY AND OXIDATIVE STRESS	21
Sevinç TAY Asiye KAYA	THE EFFECT OF LYCHEE FRUIT ON NON-ALCOHOLIC FATTY LIVER DISEASE	23
Furkan YAVAŞ Nihat YILMAZ Murat KAYA	DETERMINATION OF PHYSICOCHEMICAL AND BIOACTIVE PROPERTIES OF TOMATO PULP POWDERS OBTAINED FROM ORGANIC AND CONVENTIONAL PRODUCTION	25
Betül Selah Kamil Akbayır	THE EFFECT OF CARTOON-SUPPORTED TEACHING PROCESS ON MATHEMATICS ACHIEVEMENT AND ATTITUDE	27
I. MOUAMR S. Amalich D. BARTOUT R. ACHOUR M. BENMESSAOUD	ELECTROCHEMICAL, ADSORPTION AND THERMODYNAMIC ANALYSIS OF A GREEN INHIBITOR FOR Cu-Zn IN 3.5% NaCl SOLUTION	29
Mohammed MOUTAOUEKKIL	HIGH-Q PHONONIC CRYSTAL DESIGN BASED ON DISC-SHAPED CAVITIES	30
Fırat TEMEL	INTELLIGENCE COOPERATION REASONS AND CHALLENGES	31
Güray YILMAZ	DOES BEING TECHNOLOGY READY INCREASE CAREER SATISFACTION? AN EVALUATION WITHIN THE FRAMEWORK OF THE TECHNOLOGY READINESS INDEX 2.0	32
Umud BABAVERDIYEV Mutlu SESLİ	DEMOCRACY AND HUMAN RIGHTS IN AZERBAIJAN: CURRENT SITUATION, CHALLENGES AND FUTURE PERSPECTIVES	34



<b>Sümeyye YARDIMCI</b>	PUBLIC VISIBILITY AND THE TRANSFORMATION OF WOMEN'S MUSICIAN IDENTITY FROM THE OTTOMAN EMPIRE TO THE REPUBLIC	587
<b>Nodar Sulashvili Gocha Chankseliani Lali Patsia</b>	COMPREHENSIVE SCIENTIFIC EVALUATION OF THE PRINCIPAL CLINICAL, DIAGNOSTIC, AND THERAPEUTIC DIMENSIONS OF ENDOVASCULAR INTERVENTIONAL MANAGEMENT IN GASTROINTESTINAL AND DUODENAL ULCER HEMORRHAGE: A CONCISE CASE-BASED ANALYTICAL REPORT	599
<b>Ali Soleimanzadeh Romina Safari Hamidreza Ebrahimi Donya Ganji Motlagh</b>	APPLICATION OF NANOTECHNOLOGY AND LIPOSOMES FOR ENHANCING SPERM QUALITY AND CRYOPRESERVATION IN RUMINANTS: A COMPREHENSIVE REVIEW OF STUDIES	631
<b>Moses Adeolu AGOI Victor Oluwapelumi OGONGO Olajuwon Victor OLAYINKA Samuel Olayiwola AJAGA</b>	ADAPTIVE LEARNING TECHNOLOGIES AND PERSONALIZED EDUCATION FOR CHILDREN IN THE DIGITAL AGE	645
<b>Anga, Peter Inalegwu</b>	DEVELOPMENT AND IMPLEMENTATION OF A VIRTUAL CHEMISTRY LABORATORY FOR ENHANCING LEARNING OUTCOMES AMONG SENIOR SECONDARY SCHOOL STUDENTS IN ABUJA, NIGERIA	659
<b>Hoang Le Buu</b>	ENVIRONMENTAL LIABILITY IN THE RISK SOCIETY: THEORETICAL ISSUES AND IMPLICATIONS FOR VIETNAMESE LAW	663
<b>Suresh Kumar</b>	NANOMATERIALS FOR ENVIRONMENTAL REMEDIATION: CONCEPT AND CASE STUDIES	675
<b>N. Saidu J. H. Tsado A. Abdullahi</b>	EFFECTS OF PARTICIPATION IN ALTERNATIVE EXTENSION APPROACHES ON SMALLHOLDER RICE FARMERS' OUTPUT IN NIGER STATE, NIGERIA	681
<b>Coffi Joël ACCALOGOUN Sènakpon Socrate Sosthène TOBADA Codjo Désiré WEKEGOGO</b>	INFORMATION, AWARENESS-RAISING, AND HOUSEHOLD WASTE MANAGEMENT IN THE HOTEL DISTRICTS OF CONAKRY, GUINEA	693
<b>SALIU, M.R. Kure Isah Danjuma</b>	INFRASTRUCTURE, POLICY AND ECOSYSTEM DETERMINANTS OF AI ADOPTION IN HIGHER EDUCATION INSTITUTIONS	717
<b>Huynh Khai Minh Le Thi Kim Ngoan Do Van Tien</b>	GLOBAL RESEARCH TRENDS AND EMPIRICAL REALITIES OF INTERNATIONAL VISITOR SATISFACTION IN COMMUNITY-BASED ECOTOURISM: A CASE OF THOI SON ISLET, VIETNAM	712
<b>Daniel Marcel Aiyebilehin, Emoshoriamhe Ruth</b>	CASHLESS POLICY AND ECONOMIC GROWTH OF NIGERIA: A REVIEW OF EMPIRICAL STUDIES	723
<b>Volodymyr HOLOTA Olena SIERIKOVA Elena STRELNIKOVA Kyryl DEGTARIOV</b>	PROBLEMS OF HAZARDOUS LIQUIDS TRANSPORTING IN TANKS OVER ROUGH ROADS	727
<b>Mónika Fekete Andrea Lehoczki Ágnes Szappanos Vince Fazekas-Pongor</b>	POLYPHENOLS AND RESISTANCE TRAINING IN HEALTHY AGING: A GEROSCIENCE-BASED SYNERGISTIC APPROACH TO BRAIN AND MUSCLE HEALTH	730
<b>Erdoğan KORKMAZ Duygu ALP BALTAKESMEZ Samet MISIR</b>	THE EFFECT OF REPLACING ONION JUICE WITH CANCUR FRUIT IN CAUCASIAN MARINADE ON THE SENSORY PROPERTIES OF MEAT	739
<b>Fatma KAYA Samet MISIR</b>	THE GASTRONOMIC IDENTITY OF ADANA CUISINE: AN EVALUATION FROM THE PERSPECTIVE OF LOCAL CULINARY CULTURE, GEOGRAPHICAL INDICATIONS AND GASTRONOMY TOURISM	748



## PROBLEMS OF HAZARDOUS LIQUIDS TRANSPORTING IN TANKS OVER ROUGH ROADS

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### Abstract.

The paper treats the influence of road surface irregularities on the dynamics of the hazardous liquids movement in tanker trucks. The features of the occurrence of liquid sloshing under the vertical and horizontal vibrations of the vehicle, as well as the conditions for the occurrence of resonant and parametric resonant phenomena, have been considered.

**Keywords:** tanker truck, liquid sloshing, environmental safety, environment, hazardous effects of liquid, transportation of hazardous liquids.

In transporting process of dangerous liquids in tanker trucks, the vibrations of the liquid inside the tank have a significant impact on traffic safety. In driving on an uneven or wavy road, the vehicle is subjected to vertical and horizontal vibrations, which cause sloshing of the liquid and could lead to the occurrence of resonance phenomena [1-2].

Of particular danger is the combined vertical-horizontal excitation, in which additional resonant modes and subresonances arise, accompanied by an increase in the amplitude of oscillations of the liquid free surface. To study these processes, the paper considers the movement of a liquid in a rigid cylindrical shell under harmonic excitation:

$$a_x(t) = a_h \cos(\omega_h t), \quad a_z(t) = a_v \cos(\omega_v t),$$

The shell-fluid system was at rest at the beginning of the motion. Calculations of the free surface motion have been carried out for different values of the excitation parameters: amplitudes  $a_h$ ,  $a_v$  and frequencies  $\omega_h$ ,  $\omega_v$ . Initially, purely vertical excitations were considered, i.e., it has been assumed that  $a_h=0$ . Phase portraits of motion in coordinates  $(\zeta, \dot{\zeta})$  have been shown on Fig. 1.

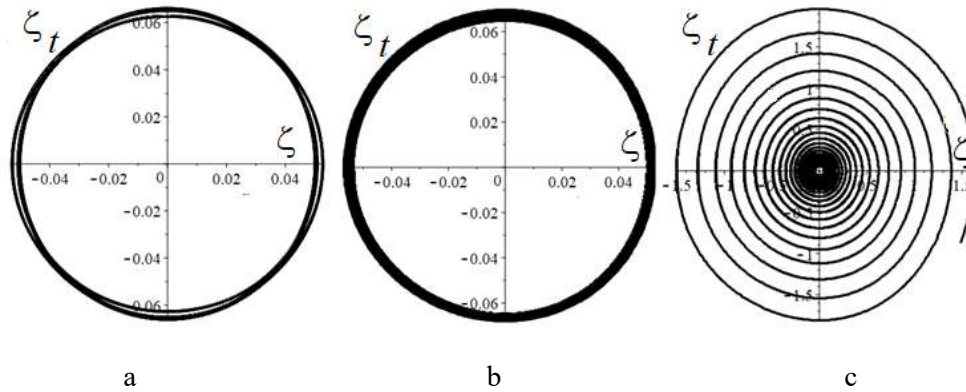


Fig. 1. Phase portraits of fluid motion under vertical load for 200 s.

Fig. 1.a) corresponds to  $a_h=0$ ,  $a_v=1$ ,  $\omega_v=1$  Hz, while Fig. 1. b) and 1.c) correspond to  $a_h=0$ ,  $a_v=1$ ,  $3\omega_v=0.65959$  Hz and  $\omega_v = 1.31918$  Hz respectively. The results show that in the first two cases the movements are stable, while for  $\omega_v = 1.31918$  Hz the amplitude increases without limits, which corresponds to the case of parametric resonance (the excitation frequency is equal to twice the fundamental frequency) [3].

Next, combined vertical and horizontal excitations were considered, i.e., a horizontal load has been added. As a result of the calculations, phase portraits have been obtained in the coordinates  $(\zeta, \zeta_t)$ , which have been shown in Fig. 2.

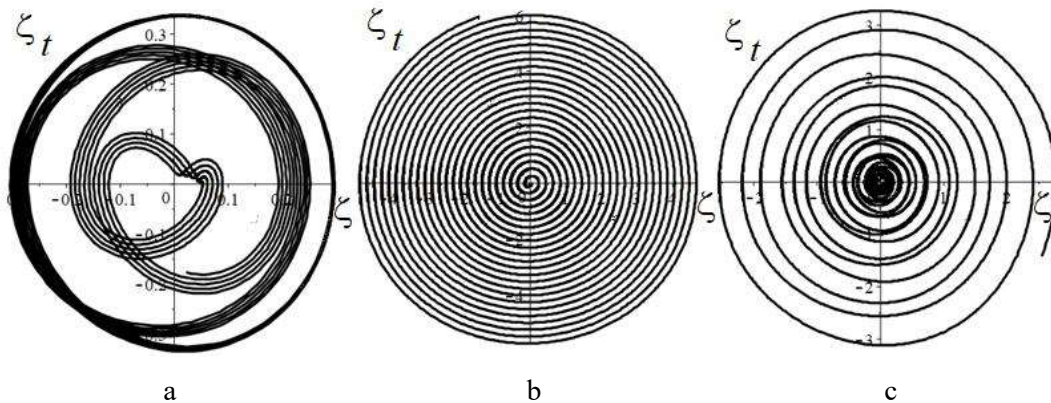


Fig. 2. Phase portraits of fluid motion under combined load for 200 s.

The following combined excitation parameters have been applied: Fig. 2a):  $a_h=0.1$ ,  $a_v=1$ ,  $\omega_h = \omega_v = 1$  Hz; Fig. 2b):  $a_h=0.1$ ,  $a_v=1$ ,  $\omega_h = \omega_v = 0.65959$  Hz; Fig. 2c):  $a_h=0.1$ ,  $a_v=1$ ,  $\omega_h - \omega_v = 0.65959$  Hz.

It should be noted that in this case another resonance associated with horizontal excitation has been observed.  $\omega_h = 0.65959$  Hz, as well as sub-resonance associated with  $\omega_h - \omega_v = 0.65959$  Hz.

Note also that certain combinations of vehicle speed  $V$  and wavelengths of the path  $L_r$  could lead to parametric instability.

The enhancement of sloshing could occur even with small road irregularities.

Vertical excitation could indirectly enhance sloshing in taking into account the nonlinear modal coupling [4-5].

Thus, driving on an undulating road causes a parametric excitation of sloshing modes due to the modification of the gravity force.



This effect must be taken into account when assessing the safety of transporting tanker trucks containing hazardous liquids.

**Conclusions.** Paper investigates the effect of vertical oscillations that occur in a tanker truck moving along a wavy road surface on the dynamics of the fluid in the tank. It is established that vertical accelerations of the vehicle lead to a change in the effective gravitational force acting on the fluid, resulting in parametric excitation of free surface sloshing modes.

It has been established that certain combinations of vehicle speed and road roughness wavelength could lead to parametric instability of fluid motion even with minor road surface irregularities. Vertical excitation could also enhance fluid sloshing in the presence of a nonlinear modal relationship.

Thus, the movement of a tanker truck along a wavy road causes parametric excitation of fluid sloshing modes due to a change in the effective gravitational field. The results obtained indicate the need to take this effect into account in assessing the safety of tanker truck operation and transportation of hazardous liquids to ensure the environmental safety of storage and transportation of such liquids.

### References:

1. Sierikova O., Strelnikova E., Kriutchenko D., Gnitko V. Reducing environmental hazards of prismatic storage tanks under vibrations. *WSEAS Transactions on Circuits and Systems*. 2022. Vol. 21. P. 249–257. DOI: <https://doi.org/10.37394/23201.2022.21.27>.
2. Holota V. Ensuring conditions for environmentally safe petroleum products transportation in tanks. *Scientific and Practical Journal “Environmental Sciences”*. 2025. № 1(58). P. 240–245. DOI: <https://doi.org/10.32846/2306-9716/2025.eco.1-58.39>.
3. Sierikova O., Koloskov V., Degtyarev K., Strelnikova E. Improving the mechanical properties of liquid hydrocarbon storage tank materials. *Materials Science Forum*. 2022. Vol. 1068. P. 223–229. DOI: <https://doi.org/10.4028/p-888232>.
4. Sierikova O., Strelnikova E., Gnitko V., Tonkonozhenko A., Pisia L. Nanocomposites implementation for oil storage systems electrostatic protection. *Integrated Computer Technologies in Mechanical Engineering – 2021. Lecture Notes in Networks and Systems*. 2022. Vol. 367. P. 573–585. DOI: [https://doi.org/10.1007/978-3-030-94259-5\\_49](https://doi.org/10.1007/978-3-030-94259-5_49).
5. Sierikova O., Strelnikova E., Kriutchenko D. Membrane installation in storage tanks for seismic loads impact protection. *Acta Periodica Technologica*. 2023. Vol. 54. P. 209–222. DOI: <https://doi.org/10.2298/APT2354209S>.