

July 29-31, 2022

Ankara Turkey

**4. INTERNATIONAL ANKARA  
MULTIDISCIPLINARY STUDIES  
CONGRESS**

**ABSTRACT BOOK**



Edited by

**Prof. Dr. Memet ŞAHİN**

**Alina AMANZHLOVA**

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## FREE OSCILLATIONS OF LIQUID IN PRISMATIC TANKS WITH VERTICAL PARTITIONS

*Elena Sierikova, PhD*

*National University of Civil Defence of Ukraine, Kharkiv, Ukraine*

*ORCID: 0000-0003-0354-9720*

*Elena Strelnikova, Doctor of Technical Sciences*

*A.M. Podgorny Institute for Mechanical Engineering Problems NAS of Ukraine, Kharkiv, Ukraine*

*ORCID: 0000-0003-0707-7214*

*Denys Kryutchenko, PhD student*

*A.M. Podgorny Institute for Mechanical Engineering Problems NAS of Ukraine, Kharkiv, Ukraine*

*ORCID: 0000-0002-6804-6991*

**Keywords:** storage tanks, sloshing, seismic loads, earthquake, free oscillations.

Regular operation, pre-repair and repair work on tanks, as well as outflows of oil products and other flammable liquids under the influence of seismic loads, fires and explosions on tanks are the source of technogenic impact on the environment. Therefore, the influence treatment of the fluctuations and vibrations on the storage tanks for environmentally hazardous liquids and the assessment of reducing the load on nature is a very relevant scientific and practical issue to improve the environmental safety of areas adjacent to the tanks [1-2].

It has been considered a prismatic tank with cross vertical distillations, Fig. 1.

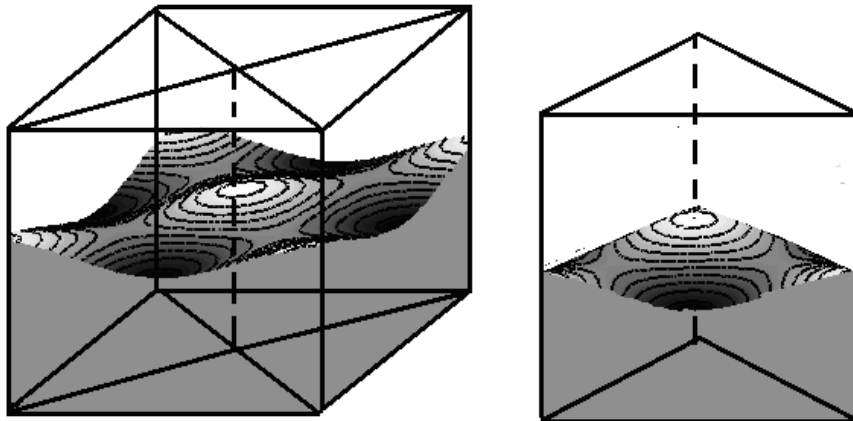


Fig. 1 Prismatic tank with vertical partitions and its compartment

The forms of liquid oscillations in a prismatic tank has been shown on the Fig.2.

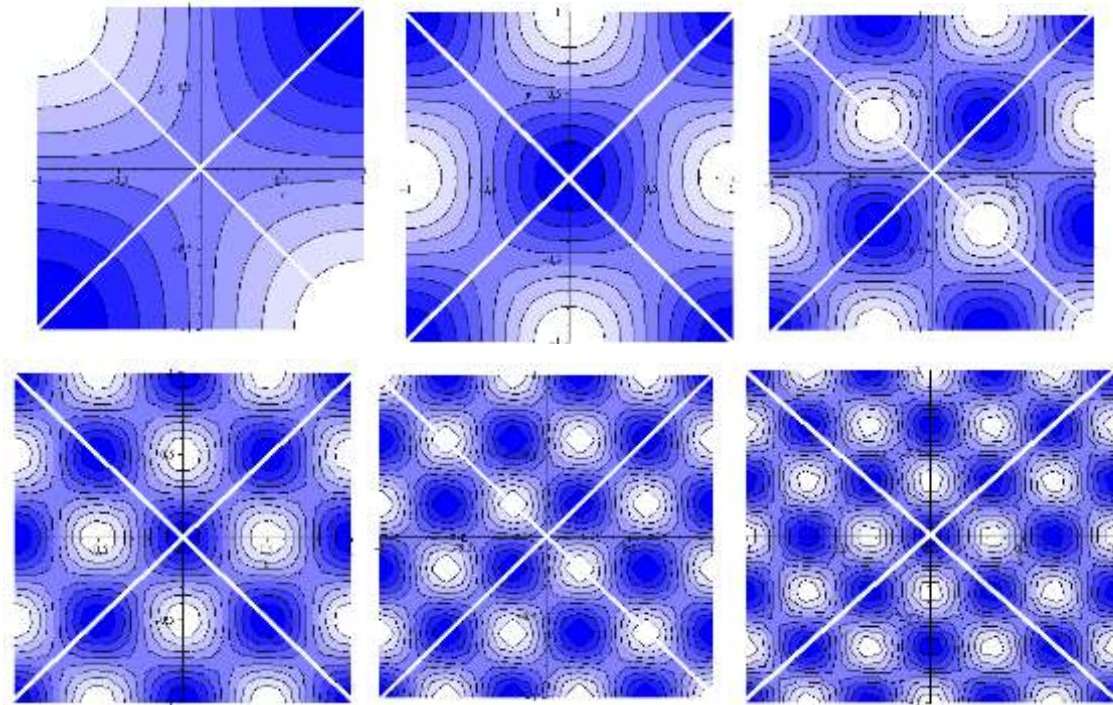


Fig. 2 Forms of liquid oscillations in a prismatic tank (horizontal section)

Fig. 2 shows the first six forms of liquid oscillations in a prismatic tank with cross partitions.

Table 1 shows a comparison of liquid oscillation frequencies in prismatic tanks with and without partitions.

Table 1. Fluid vibration frequencies, Hz

$n$	without partitions	with partitions
1	4.051164194	4.613563138
2	4.051164194	6.008587070
3	5.710012556	8.085473483
4	5.892165855	9.336315604

Note that the obtained forms of oscillations have the same form in each compartment. The frequencies of liquid oscillations in a tank with partitions in comparison with the frequencies of oscillations of a prismatic tank without partitions [3-5] increase. We also note that in the considered case only symmetrical forms have been implemented.

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