CASIA III cohort 1

CZECH UNIVERSITY OF LIFE SCIENCE

Mobility type: Doctorate

Duration: 18 month

Ruslan Askarbekov

European Commission
ERASMUS MUNDUS

CASIA Project

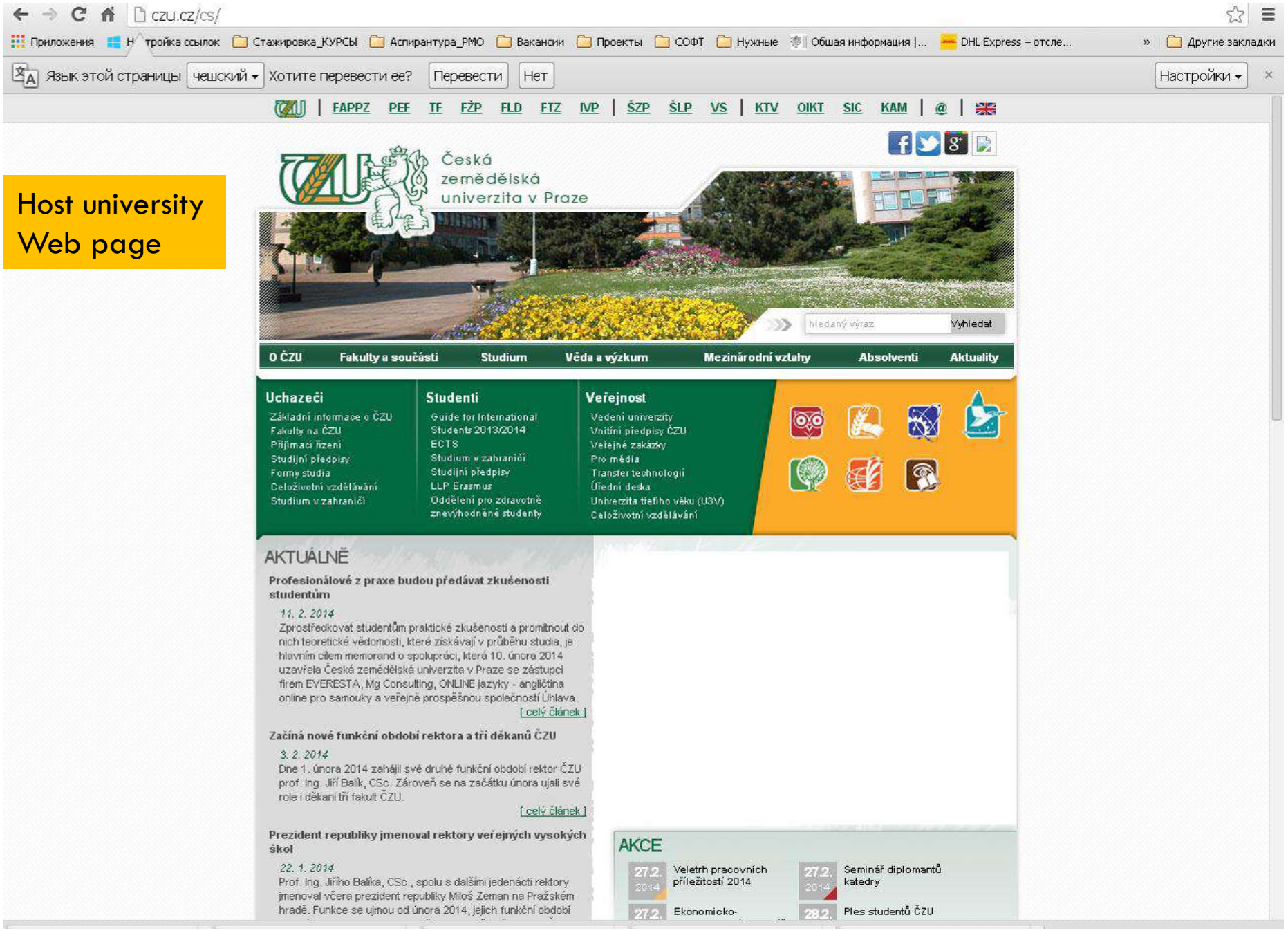
CASIA wider objective is the establishment of a sustainable / operational network for academic exchange between Central Asia and European countries with a view to creating centres of excellence.

The Consortium brings a wide range of disciplines together, but focuses on **agriculture, life sciences, trans-boundary natural resource management, climate change** and **environmental practices** required for mitigation of consequences of the **Aral Sea disaster** and finding solutions for increasing competition between CA countries for water, e.g. in a view of agriculture and energy production. The chosen main disciplines are addressing the regional, common needs of four CA - countries involved. The wider objective is very relevant in the context of modernisation of partner Universities and adaptation of their education capabilities towards reformed countries economy in the region.

The proposed CASIA project aims at the following specific objectives:

- To enable a larger group of talented CA students to study at EU universities and benefit from already established educational links with EU universities, leading to a degree at an EU university and at the same time to a degree at their home university (Double Degree)
- To enable BSc, MSc and PhD students from CA to study in another country during their regular study programme at home university
- To stimulate exchange of BSc, MSc and PhD students between CA and EU
- To bring together scientists from East and West during joint supervision of MSc or PhD thesis work
- To enhance the qualifications of teaching staff, young researchers and administrative staff from CA-countries and
- To facilitate the transfer of academic expertise to CA academic institutions, upgrade curricula and to modernize of research methods

Host university Web page



Faculty of Engineering

You need to find contact information of professors, who can be your supervisor in host university

Doctoral Study

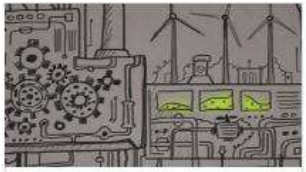
Doctoral study program (**DSP**) is designed for university graduates who have completed their prescribed State examination in the art to which the **DSP** builds or related field. The basic objective of the DSP is to acquire and demonstrate the ability of independent scientific work in the discipline process and defending a dissertation, publications and other forms of presentation of their own research activities, including passing all the tests and the state doctoral examination. Lists of study programs can be found below.

The curriculum is organized in two forms - time and combined. Full-time study is a major form of doctoral studies and the main job student. Full-time students have the status of college students and for studies they paid a monthly doctoral scholarship. Combined study compared the form of doctoral studies designed primarily for applicants from practice or from among the faculty staff, while they remain employed by their employers.

DSP graduates are awarded the academic-scientific title "**Doctor**" (abbreviated to "**Ph.D.**" behind the name).

PhD (Doctoral) degree programmes

Energetics



Marketing of Machines and Technical Systems

Technology of Manufacturing Processes

Technology of Agricultural Technology Systems

The quality and Reliability of Machines and Equipment

Engineering of Agricultural Technological Systems (EN)

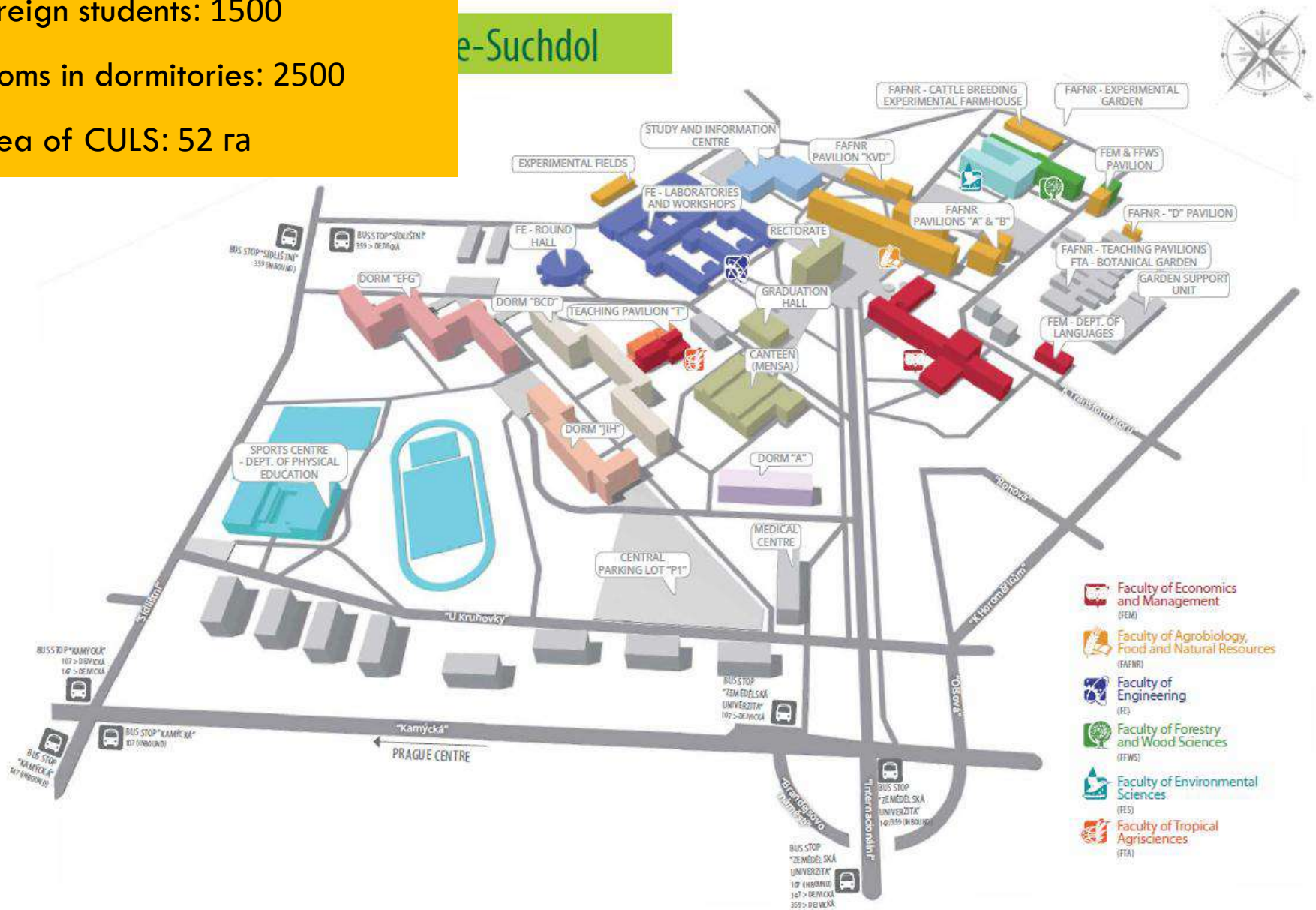
Prague (en) or Praha (cz)

Students: 28000

Foreign students: 1500

Rooms in dormitories: 2500

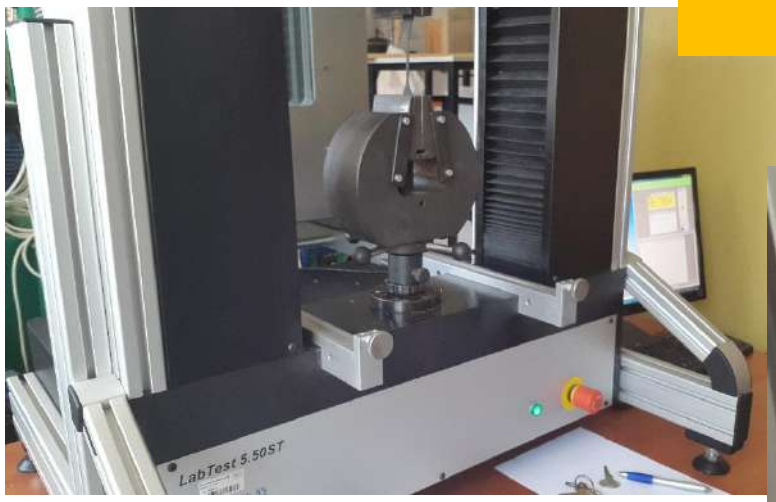
Area of CULS: 52 ra



National Technical library in Prague

Labs in CULS

Labs in CULS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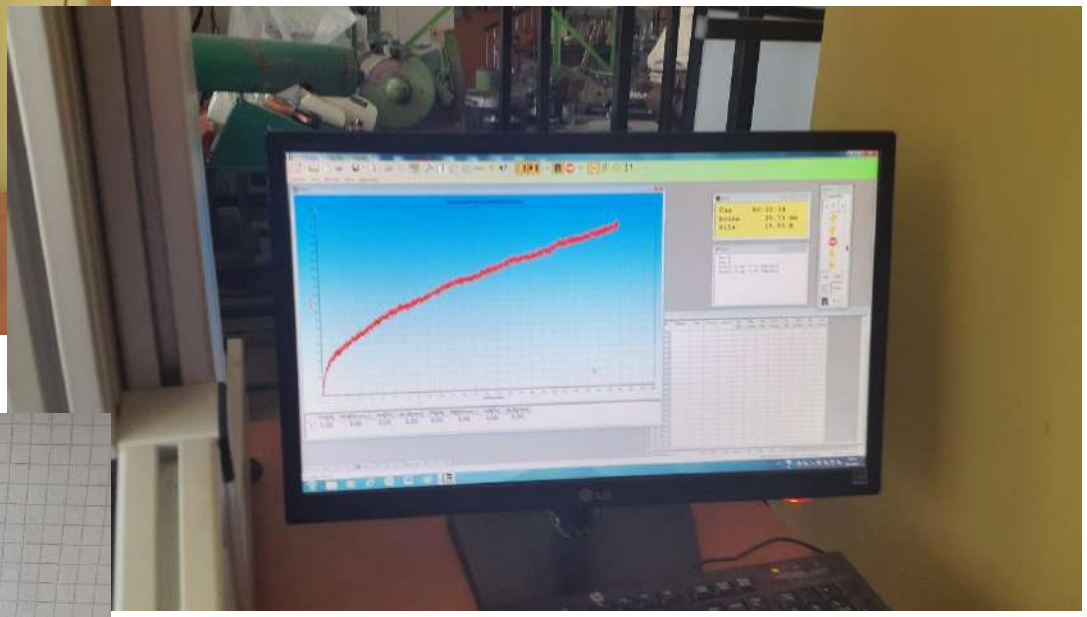

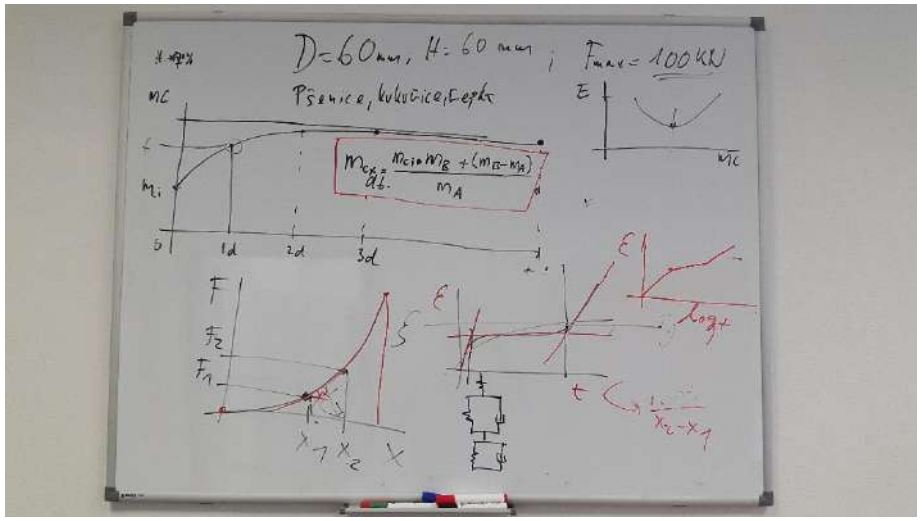
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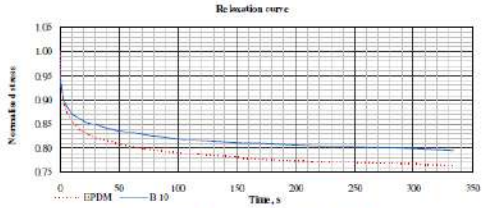

Fig. 5. **Relaxation curves of rubber B10 and EPDM**

Conclusions

From the conducted experiment, rubber under uniaxial tension has been described and the mechanical properties under the relaxation test of rubbers by using the Wiechert model. Stress relaxation is defined as decreasing under stress with the times under constant deformation. In rubber, stress relaxation occurs due to slipping of entanglements loosening the network of molecular chains, so they apply less force. The data obtained during the experiment show that for determination of relaxation of the rubber specimen the tensile test can be used. In contrast to work [2], the generalized Maxwell model (Wiechert model) has been used for precision description of the behavior of a rubber material, and it has been confirmed that this model describes the relaxation process quite well.

As seen from Fig. 5, the relaxation curves for rubber B10 and EPDM are different from each other. The relaxation curve for rubber B10 showed that more elastic material with higher viscosity allows to use it as amortization rubbers. Also it is known that such rubbers are used for the design of the rubber metal elements in nodes of machines.

Acknowledgement

CASIA project (http://www.eu-casia.org/home) gave a support for doctorate mobility to R. Askarbekov and allowed to visit the Czech University of Life Science in Prague and to hold this test and finish this article.

References

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In figures (3a, 3b and 3c) show the frequencies of vibrations layouts using rubber metal supports. With rubber metal supports with hardness of 60 Shore A units, the frequency of oscillation reached the countertop shaker of 12.5 Hz whiles the top of the first level of the building layout fluctuations was 7 Hz. The difference indicates the presence of rubber-metal supports effect on vibrations. The oscillation frequency of countertop and top level of layouts (the second level) recorded vibrations of 2 Hz using two RMS between the source and the object vibrations. Rubber with hardness of 50 Shore units recorded different fluctuations.

The sensor mounted on the shaker had a frequency of 4.5 Hz. The oscillation frequency at the top of the first and second level layouts obtained 2.4 Hz. Fluctuations occurred only in the horizontal X-axis where a maximum frequency of oscillation was excited at -50 Hz by the shaker. In the second graph (Figure 2b) oscillations occurred only in the vertical Y-axis.

The oscillation frequency was 11.5 Hz on a vibrating table whiles on top of the first level and at the top of the second level recorded -5.8 Hz and1.1 Hz for rubber with hardness of 50 Shore units. For the rubber with hardness of 60 Shore units, the values were slighily different. On the shaker the vibration frequency was 11 Hz, on top of the layout of the first level was -7 Hz and at the top of the layout was -1.8 Hz. These oscillation frequencies appeared when the frequency of oscillation was excited at 50 Hz by the shaker. It should be noted that vibrations on the vertical axis of the frequency vibrations with rubber hardness of 50 and 60 units showed no visible difference. The case of X and Z distribution of vibrations had the same horizontal directions of fluctuations in the layout of the building. This suggests that rubber metal supports with lower hardness could be suitable for damping of the vibrations. The reason is that the softer rubber has its own vibration frequency higher than that of rubber with high hardness.

4 CONCLUSION

The experimental results show the effectiveness of using rubber metal supports (RMS) for vibration damping for the protection of buildings and other engineering structures. Due to the natural vibration, frequency vibration of RMS was noticed from an external source for reducing the effects on the object. The elastic properties of the rubber layer had great impact on the manufacture of rubber metal elements of the static load. The elastic energy in the rubber layer of RMS damping of the oscillations and metal elements were used for mounting and load sharing with the weight of the object. Simulated seismic waves and its impact on buildings and constructions were described as the forced oscillations at resonance, abnormal vibration of machines and equipment. The oscillation time influence on the object was observed between 60 and 90 minutes. Softer rubber composition functions were better for rubber-metal supports.

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ORMONBEKOV,T.O., BEGALIVEV, U.T. et al. 2005. *The use of thin layer of rubber-metal supports for seismic isolation of the buildings in the territory of the Kyrgyz Republic*. Bishkek: "Uchkun", 2005. 215 p.

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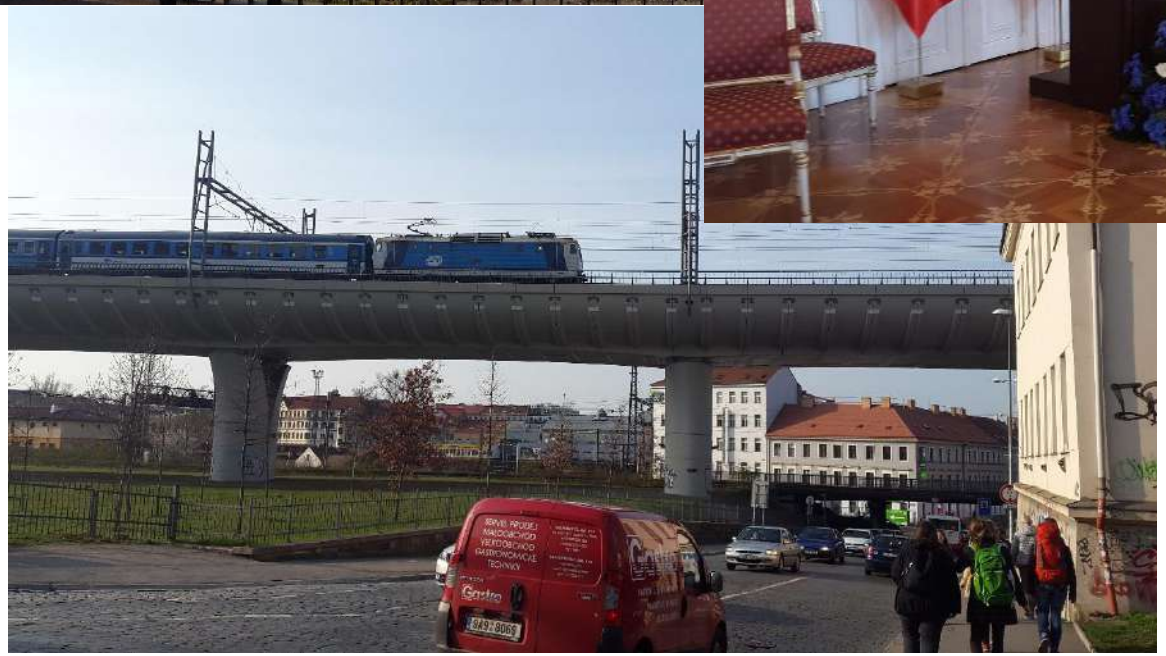

Thank you for your attentions!