

STEPS Students Report

Ekaterina Sentsova (D1)
Faculty of Geology, MSU

My name is Ekaterina Sentsova. I'm first year PhD student at the Department of Engineering Geology in Lomonosov Moscow State University. From 16th of January to 12th of March 2017 I had been participating in Students and Researchers Exchange Program in Sciences (STEPS) in Tokyo University. I was studying in the laboratory of Professor Reiko Kuwano, Institute of Industrial Science. I clearly understand that two month are not enough to get some important scientific results for my PhD topic. That's why the aim of my internship was to improve my basic scientific and experimental level. It's well known that Japanese researchers are among the world leaders in Civil engineering, especially in the study of dynamic, deformation and straight properties of soil, due to a very complicated and intensive geological situation of their region.

Now for civil engineers, the most significant topic is triaxial shear tests. The triaxial test is almost always chosen for studies of a new phenomena, because it is relatively simple and versatile. The triaxial test is the most suitable for such studies and it is required in geotechnical engineering for the purposes of design of specific projects and for studying and understanding the behavior of soils.

The laboratory of Professor Kuwano has many modern and important equipment for studying property of soils manual including triaxial cells with different modifications.

In Moscow I am working in geotechnical laboratory in my university and we do have triaxial cells, but they are only automatic, that's why it was important for me to understand how our Japanese colleagues are working.

During my stay, we did a series of soil samples in triaxial conditions. It's well known that laboratory tests are made to simulate field loading conditions as close as possible, that's why each test includes 3 stages: water saturation, consolidation and shearing.

When we made our tests, to achieve different scientific aims we used additional accessories:

1. Bender elements allow to measure the maximum shear modulus of a soil sample and from this data to evaluate the stiffness of soil Theory on shear wave propagation in an elastic body tells as the value of the shear modulus of the soil from measurement of shear wave velocity, which can be obtained with bender elements.

2. LVDT (linear variable displacement transducer) is a type of electrical transformer used for detailed measuring linear displacement of soil during the test. It is important to know displacement of soil particles to calculate deformations.

During my stay, I had been studying many interesting methodic and new equipment. In conclusion, I would like to thank all working community of STEPS program, and especially my host professor Reiko Kuwano and her laboratory for their hospitality and kindness. You give me great knowledge and motivation for my further research. Three Japanese students have already come to our geotechnical laboratory of Moscow State University, and we are waiting for another one this summer. I think it is great opportunity to improve relationship between our universities. I hope for future cooperation.