

# STEPS Students Report

Aleksei Poliaev (D2)  
Faculty of Chemistry, MSU

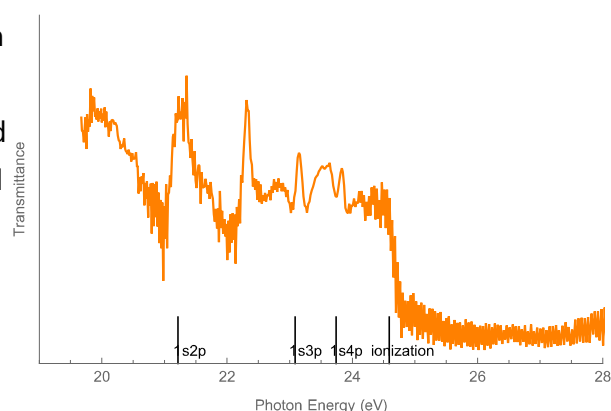
Participation in the STEPS program occurred to be very good opportunity to improve my knowledge in laser experiment. I've visited Prof. Kaoru Yamanouchi group and performed high-order harmonics generation experiment under guidance of Dr. Yamada. This research group has very good equipment, a competently constructed workflow, interesting tasks. This internship was my first international scientific experience and I suppose it was fruitful.

Goals of my research were:

- Learn how to generate high-order harmonics
- Absorption measurement of He irradiated by near infrared (NIR) and high-order harmonics
- Absorption measurement of He irradiated by only the harmonics
- Absorption measurement of He irradiated by NIR & harmonics scanning the delay between them

In the framework of this internship, I've studied how to work with lasers and optical equipment, developed program to control mirrors to manipulate the delay between lasers. We've observed interesting effect of splitting of the He absorption lines:

As you can see on the image, absorption for 1s3p line splits, the origin of this effect is still under consideration. Such splitting was described in other works only for 1s2p line. We've observed it for 1s2p, 1s3p, 1s4p lines. I plan to carry out theoretical calculations in the future to try to explain this effect.



I really liked Tokyo University and the city itself. This is a real metropolis, in which there are many interesting things and constantly something happens. It was a very inspiring two months, I've performed interesting experiment, made some friends, experienced Japan. I strongly recommend others to participate in STEPS.