

STEPS Students Report

Ivan Zaitsev (M2)
Faculty of Physics, SPbU

Aim of my visit to Tokyo University was to study magnetic reconnection in space plasma within a Hoshino group during one month.

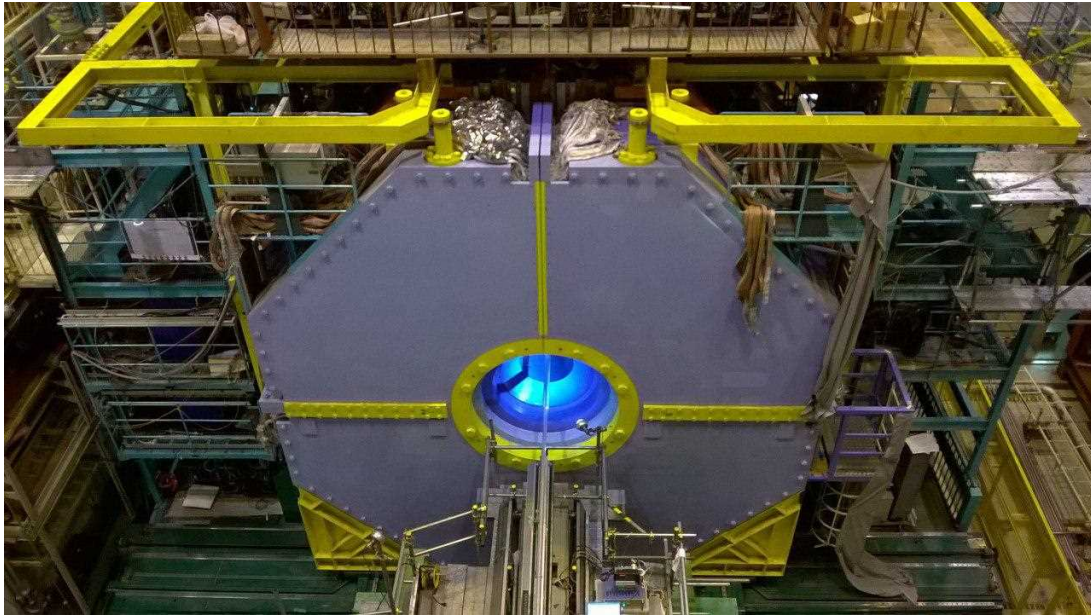
At first, I made a presentation about my previous research in this area. Professor Hoshino and Assistant Professor T. Amano have carefully listened to my report and proposed me to prepare a speech in front of all laboratory members. At first week, I clarified about simulation model calculations on computer cluster. At the first Friday, we discussed the results that I had found. One of the interesting facts was a good agreement between one-dimensional PIC («particle-in-cell») modeling of reconnection process with the numerical solution in two-dimensional magnetohydrodynamics (MHD) approximation Chew-Goldberg-Low (CGL) produced by K. Hirabayashi. It is the most important point in my visit to Tokyo University. It all made possible to create a collaborative publication. The idea of this publication is to compare the two different methods that produce similar results. It can be considered as an evidence of plasma anisotropy existing in reconnection exhaust and fire hose instability that was developed in case of weak guide magnetic field.

The second week of my residence in Tokyo, 11–16 July, was devoted to East-Asia School and Workshop on Laboratory, Space, Astrophysical plasmas in Tsukuba. Prof. Hoshino has led a financial support for my participation in this event. I was wondering in the majority of topics because almost all of them concentrated around my field of study. I had poster presentation and a short speech to introduce my study. At the Saturday, 16 July, we went to visit JAXA Tsukuba Space Center and KEK High Energy Accelerator where I have felt that I am able to see modern advanced research.

Unfortunately, one month was too short for a complete research, but it was enough time to discuss actual problems in our field of science. For example, we were excited in discussion of existence of a slow shock in reconnection process and features of ions acceleration. Professor Hoshino had provided me many useful information about this topics and I had studied CGL MHD theory of double adiabatic approximation of space plasma. Besides, every Friday employers of Hoshino lab organized seminars where one its member had presented his results to everyone. In one of these meetings, I was acquainted with the relativistic MHD turbulence in reconnection from a report of M. Takamoto and saw C. Moissard's speech about tearing instability modeling.

In Tokyo, I was inspired in many kind of things. I really appreciate the friendship atmosphere in Hoshino lab and appreciate all the people that helped me to accommodate in such exotic

country and showed me this beautiful world. I would like to thank the staff of the STEPS program that gave me opportunity to visit Japan and to see such level of technology and science by myself. Special thanks to Fujimi house for comfortable accommodation. I have met many beautiful people in Japan and felt myself like in a fairy tale where people and nature itself produce a spectrum of good memories.



KEK accelerator



With Prof. Hoshino lab members