

外国人客員所員を経験して

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I had visited ISSP (at Nakatsuji lab.) almost every year since 2009 during my semester break. In collaboration with Prof. Satoru Nakatsuji, I was always excited in synthesizing new materials and more interestingly to follow its flourishing the new physics. In 2015, Nakatsuji group discovered a large anomalous hall from antiferromagnetic Mn_3Sn and Mn_3Ge . It was a great challenge for me to take a one-year visiting professor position at ISSP to extensively explore the fundamental science as well as the application of Mn_3Sn related compounds. After getting permission from the rector of my institute, Institut Teknologi Bandung (ITB), as a sabbatical leave, a quick arrangement was carried out by the ISSP ILO team to complete the administration procedures in order to start the project as early as possible. Finally, the program was set from the beginning of March 2016 to the end of February 2017.

The exploration to enhance the properties of Mn_3Sn was attempted using various kinds of doping to tune the chemical potential of the system. The physical properties of the doped samples show significant changes and require a better theoretical model to understand all of the effects. On the other hand, the enhancement with respect to the performance criteria for the application is still far from being achieved. One year has turned out to be quite short for me to fulfill this target. However, since not all the possibilities have been explored, there is still chance that it could be realized. All of this work was carried out using single-crystalline sample. I would like to thank Takashi Nishikawa (M1) and my students from ITB, who assisted me to characterize, orient and cut the crystals having a suitable size for physical characterizations. Those are time-consuming work and

share much of responsibility. I also thank Akito Sakai (research associate) for providing heat and electrical transport data to judge the performance criteria of our samples. Fortunately, the crystal growth facility and all the characterizations can be carried out in Nakatsuji lab. I thank Ishii for helping us measuring the elemental compositions. Beside Mn_3Sn and Mn_3Ge , I also explored various compounds predicted to have Weyl fermion and the results are still in progress. Related to the Mn_3Sn project, I had opportunities to collaborate with the group of Prof. Yoshichika Otani which focused on the spintronics and the group of Prof. (Associate) Takeshi Kondo which focused on ARPES measurement. The internal collaboration among research groups in ISSP to investigate the electronic structure, the magnetic structure as well as the physical properties of Mn_3Sn including its potential for spintronic application was very interesting activities during my stay.

When I started to work at ISSP, it was nearly spring. I had an opportunity to observe the new academic atmosphere in Kashiwa campus, especially at ISSP. During my stay at ISSP, I enjoyed many social activities: starting from hanami in spring, barbecues in summer, music festival and end year party in winter. I think those activities are quite positive for the interaction between students and staffs. During the ISSP barbecue, I could chat with Prof Osamu Yamamuro and invited him to the international conference organized by the association of Indonesian material science in Bali. In the future, I expect many ISSP staffs could make their time to attend an international conference in Indonesia.



Although I have visited Japan, in particular ISSP, many times, I have very little Japanese survival sentences. After a one-year duration of stay, I still have not improved my Japanese. Maybe the life between ISSP and Kashiwa Lodge where I stayed was very convenient so I had less cultural experience. During summer, my family visited me in Japan. They had already experienced the summer in Tokyo, which is quite hot, so with the help of Akiko Kameda and Dr. Hiro Suzuki, I could place them in Sendai and they enjoyed exploring touristic spots around Tohoku area.

I had a great time during my stay at Nakatsuji's group and at ISSP. For that, I would like to thank: Masaki Tsujimoto and Dr. Takahiro Tomita for their technical assistance, our group secretaries Mariko Suzuki and Yuko Ishiguchi for their help with administration, and ISSP ILO team Akiko Kameda, Atsuko Yamauchi and Ayano Hashiguchi for helping me settle to live in Kashiwa and work at ISSP. I hope, in the future, I could contribute more to Nakatsuji group as well as to ISSP.