

The Global COE Program B1103

“The Next Generation of Physics, Spun from Universality and Emergence”

Bilateral International Exchange Program (BIEP, invite) report

Send report to: Your responsible Professor in Kyoto University

gcoe-biep@scphys.kyoto-u.ac.jp , gcoe-office@scphys.kyoto-u.ac.jp

(Year/Month/Day)_____2011/07/15_____

Invited Student

Name	Tevong
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Name and Position of Ph.D. advisor	Professor Charalampos Anastasiou
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Responsible Researcher in Kyoto University

Name	Tatsuo Kobayashi
Group and Faculty	Theoretical high energy physics
Position	Professor
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Phone and FAX	

Research Project

Title	Constraints from vacuum structure in the general NMS
Duration	2 months and a half

Please summarize your activities and results during your stay in Kyoto University. Also please describe how your stay has been beneficial to the graduate students in the institute. You can add a sheet, if you need more space. You can also write any comments and requests to the GCOE program.

After investigating possible topics within the composite little Higgs mechanism in a supersymmetric context, I ended up working with Professor Kobayashi on the next-to-minimal supersymmetric standard model (NMSSM). This is one of the promising theories for physics beyond the standard model that will be tested at the LHC. We extended the analysis of a previous paper on constraints from the vacuum structure of the potential to the case of a more general potential. This is of interest for certain types of NMSSM models with a large lambda parameter, required to obtain a heavy Higgs mass as suggested by naturalness and the LEP bounds. Our preliminary results show that in the general model the parameter space is less constrained and a large lambda is possible. Towards the end of my stay we have started collaborating with Takashi Shimomura and Tsubasa Takahashi from the Yukawa Institute for Theoretical Physics. We intend to continue this work for an eventual publication.

During my time here I took part in the activities of the department. I attended the journal club and seminars regularly, and gave a presentation on composite Higgs. I also enjoyed the social aspect, having dinner with the group and occasional outside trips to restaurants, beer gardens, and karaoke. This was a good opportunity to get to know the students, who were keen on practicing their English. I spoke regularly with those in my office, and we organized a sushi dinner with the students and two other of my English friends. I was very grateful for the farewell party they organized at the end.