

**The Global COE Program**  
**“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

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(Year/Month/Day)\_\_\_\_\_

**Invited Student**

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**Responsible Researcher in Kyoto University**

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**Research Project**

Title	Application of supereddingtonian, relativistic slim disk solutions to Ultra Luminous Xray sources spectral anal
Duration	1-30 April 2009

**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 host institute. You can add a sheet, if you need more space. You can also write any comments and requests to the GCOE program.**

During the visit at the Kyoto University I worked with a graduate student, Ms. Kiki Vierdayanti, Prof. Shin Mineshige, and a GCOE post-doc. Dr. Dominikus Heinzeller to the point of Ultra Luminous X-ray sources (very luminous black holes) and their spectral analysis using the theoretical predictions based on the relativistic slim disk model of accretion disks. Our plan is that my group (together with my colleagues in Poland and Czech) work on the disk structure and ray-tracing calculations, whereas the Kyoto group performs spectral fitting to the theoretical spectra and compare them with observational data. We successfully started the collaboration. Currently, we continue our project analyzing the theoretical continuum spectra of slim disks using the “p-free” model (with which we can probe the presence of super-critical accretion flow) built in in the Xspec package. We are expecting to obtain in few weeks conversion tables which let us apply relativistic slim disk models to real spectral fitting. Through our collaboration, we expect to be able to determine BH mass or spin for the observed ULXs.

My stay at the Kyoto University was definitely beneficial not only for myself and my colleagues in Poland but also for the students in department of astronomy, as I gave in a short time two seminars to the point of the collaboration I started with Mineshige san and Kiki Vierdayanti.