

(For JSPS Fellow)

Form B-5

Date (日付)

2014/9/14

(Date/Month/Year: 日/月/年)

Activity Report -Science Dialogue Program-

(サイエンス・ダイアログ事業 実施報告書)

- Fellow's name (講師氏名): Jens Wittsten (ID No. P12782)- Participating school (学校名): Fukushima Prefectural Fukushima High School- Date (実施日時): 2014/9/5 (Date/Month/Year: 日/月/年)- Lecture title (講演題目): (in English) Mathematics and seismic imaging(in Japanese) 数学や 地震探査

- Lecture summary (講演概要): Please summary your lecture 200-500 words.

I come from Sweden, which is located in northern Europe. I did my graduate studies in Lund, and now I am a postdoctoral fellow working in Kyoto. I do research in Mathematics, and my specialty is so-called partial differential equations. These involve the notion of rate-of-change of a function, and can be used to describe many physical phenomena, for example heat and sound waves that travel through different media. One project that I have been working on while in Japan using partial differential equations comes from the area of applied Geophysics. Namely, sometimes the data you get in seismic tomography is very sparse (undersampled) and the question is how to fill in the gaps. In seismic tomography, recorded seismic waves (such as earthquake data or marine seismic surveys) are used to map the layers in the Earth's crust, much like how one in medical tomography use x-rays to produce images of the interior of a person's body. In marine seismic surveys the data often contains gaps, and my collaborators Fredrik Andersson (Lund University) and Yoshinori Morimoto (Kyoto University) have developed a technique by which the known data is smeared out into the gaps, similar to how heat from a radiator spreads out in a cold room. We have also conducted numerical experiments showing the result of our method.

- Language used (使用言語): English and a little Japanese

- Lecture format (講演形式): Oral presentation with visual aids.

◆Lecture time (講演時間) 60 min (分), Q&A time (質疑応答時間) 30 min (分)

◆Lecture style (ex.: used projector, conducted experiments)

(講演方法 (例: プロジェクター使用による講演、実験・実習の有無など))

Used projector and blackboard, conducted mathematical demonstrations on blackboard.

◆Interpretation (ex.: assistance by accompanied person, provided Japanese explanation by yourself) (通訳 (例: 同行者によるサポート、講師本人による日本語説明))

No assistance.

◆Name and title of accompanied person (同行者 職・氏名)

No assistance.

◆Other note worthy information (その他特筆すべき事項):

The coordinating teacher at Fukushima Prefectural Fukushima High School (Sasahara san) relayed that the students were impressed and had become more interested in Math, which I was very glad to hear. The illustrations I provided were said to be helpful, and one student had been glad to discover that the ability to understand spoken English was higher than expected.

- Impressions and opinions from accompanied person (同行者の方から、本事業に対する意見・感想等がありましたら、お願いいたします。):