

Report of Research Activity : 1 – 12 March 2010

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During my two-week visit to the Earthquake Research Institute (ERI), I engaged in the following research-related activities :

1. I carried out research on a project entitled « Efficient representation of crystal preferred orientation using structured basis functions ». The goal of this research is a computationally efficient representation of crystal preferred orientation (CPO) that can be used to predict the evolution of seismic anisotropy in three-dimensional time-dependent convective flow models. I presented this work in detail to M. Morishige (Ph. D. student under the direction of Prof. S. Honda), who is using three-dimensional numerical models of the flow around subducted slabs to predict the magnitude and direction of shear-wave splitting around subduction zones.
2. I carried out research on a project in the area of fundamental fluid mechanics entitled « Scaling laws for capillary breakup of viscous threads ». The aim of this work is to develop a theoretical understanding of recent experimental findings that the critical length for capillary breakup of a falling viscous thread depends in a simple way on the flow rate and the fluid's viscosity.
3. I engaged in extensive scientific discussions with several members of ERI (Prof. K. Kurita, Prof. M. Ichihara, T. Toyota, M. Morishige) and with A. Namiki of the Department of Earth and Planetary Science.
4. On 8 March, I gave a formal seminar entitled « Thin-Sheet Dynamics of Free Subduction » at ERI.
5. On 10-11 March, I and Prof. Kurita visited Prof. Y. Hayakawa and his group in the Department of Physics of Tohoku University in Sendai, where I gave a formal seminar entitled « Acrobatics of Liquid Ropes ». We also visited the group of Prof. T. Ishikawa in the Department of Bioengineering and Robotics, where we discussed the question of how to incorporate fluid-mechanical lubrication theory into boundary-element numerical simulations of slow viscous flow.
6. On the afternoon of 12 March, I and Prof. Kurita visited JAMSTEC, where I gave an informal version of my ERI seminar on free subduction.