

World Center of Education and Research for Trans-disciplinary Flow Dynamics

Ramchandra P. Chopade
Department of Mechanical Engineering
Indian Institute of Technology Guwahati,
Guwahati, India.

Research title: BOUNDARY HEATERS DESIGN FOR THREE DIMENSIONAL RADIATIVE ENCLOSURES WITH THREE DIMENSIONAL DESIGN SURFACES.

Supervisor: Prof. Shigenao MARUYAMA.

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My three months stay at I.F.S. Sendai, Japan was an exciting and valuable opportunity to broaden my radiation heat transfer knowledge and exchange ideas with other researchers. I learnt a lot from the members of the Maruyama-Komiya lab about several areas of radiative transfer of which I had previously no or little experience. These include REM2 method, micro genetic algorithm from Professor Maruyama; Patran heat transfer analysis software from Assistant Professor Sakurai of Niigata University; and the FORTRAN language from all my lab colleagues. It was particularly interesting to learn about the REM2 and its application to various fields. I was impressed by the high level of teamwork between the lab members and Professors in Maruyama-Komiya laboratory.

I spent most of my time in the lab but meantime also made visit to Niigata University for three days. I discussed with Dr. A Sakurai, the issues related to my work. I must thank him for his valuable suggestions and support. I also visited to local temples with professor Maruyama and found that there are many similarities in the customs of temples to that of my country, it's interesting. I am lucky enough to attend the semester seminar camp at Motoyoshi, Miyagi. I found a very good relations and coordination among the lab members and professors. It's rare. Those moments are a memorable to me forever.

I was especially interested in optimization in the field of heat transfer and it was interesting to work in the same area with different methods. I used REM2 method for radiative transfer calculation; I found this method is the most of the suitable to connect with optimization methods. The results I got here are useful to my thesis work, particularly the application of the genetic algorithm and conjugate gradient method for optimization with REM2. Particularly I solved some practical field problems of the furnace aim to the uniform heat flux distribution over the desired surface called design surface. It is important in the many industrial applications, like drying process, heat treatment process, in the food industries etc.

I used to present my work in the weekly seminar of Maruyama-Komiya lab. It was very directive to me to get the thoughts and suggestions of the professor Maruyama and senior assistant professor Komiya at every weekly seminar and that kept me enthusiastic and update to my work with right direction. I found that weekly seminar is essential to keep the students update and to exchange the ideas among the students and professors.

I enjoyed learning a little about Japanese culture and history during my short stay. I would like to return in the future to explore these further more if the time permit. Overall I found the Japanese peoples are very much sincere, friendly, work loving and

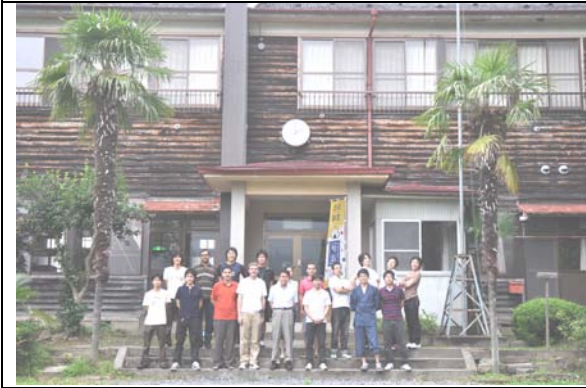
cooperative. Even a little time with Professor Wada, it was a very nice time with him. I would like to thanks Professor S. Maruyama and the all Global COE program members for making my trip possible and hope that the cooperation between will be continue in future.



Enjoying the traditional dinner with lab members during seminar camp.



At Niigata university; with Dr. Sakurai, Dr. Matsubara and his lab members.



With professors and lab members during seminar camp.



Presenting my work in seminar camp