Division of Environmental Studies

Department of Ocean Technology, Policy and Environment

Laboratory	Faculty	Introduction of research activities and laboratory	Key words	Projects or activities summer program students can participate
Takagi Laborator	Prof. Ken TAKAGI	Takagi Lab aims at enhancing ocean technologies which could overcome big issues of mankind such as depletion of natural resources, food crisis and global warming. For this purpose, we are conducting several marine projects and trying to identify key technologies in each project. Now, we focus on the ocean current turbine system, which convert ocean current energy to electricity. So far, we formed a consortium with several private companies, and developed a prototype floating current turbine which was tested last year. We are also interested in other offshore technologies and expanding the research field such as marine drones, floating systems and riser systems. These technologies are expected to be applied for offshore oil & gas development in developing countries and the construction of wind farm in Japan. It is noted that our final goal is not only to develop new technologies but also to make proposals for ocean technology policy in comprehensive and systematic fashion based on findings in these research projects.	Ocean renewable energy; Offshore technology; Oceanic engineering; Marine technology	We are developing a floating type ocean current turbine system as stated above. The full scale device is planned to have two big turbines whose diameter is about 40m for the 2MW system. We have done a demonstration of a 100kW prototype model in water of off Kuchinoshima Island. However, we still have many concerns. Major concerns to commercialize the proposed system is whether the system is safe, reliable and low cost or not in realistic ocean current which contains turbulence, wave effect. To give an answer, we have conducted an ocean current measurement at sea as well as a numerical simulation of ocean current. On the other hand, we developed a simulator of the current turbine system. Combining measurement data and the simulator, we are tackling above mentioned concerns. Summer program students can participate elementary researches which have wide spectrum from analysis of the real sea data to the simulation of the device controlling system. Details of the research theme will be decided after consulting with the supervisor according to the knowledge and ability of the candidate. However, it is preferable if program students have knowledge of fluid dynamics and/or dynamics of rigid bodies.