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 Laboratory	Prof. Ken TAKAGI	We are developing ocean technologies which can overcome big issues such as depletion of natural resources, food crisis and global warming, and basing on the experience of development we make policy recommendations. For this purpose, we are operating 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 we developed a prototype floating current turbine which was tested last year. We are expanding the research field to conventional offshore development such as marine drones, floating systems and riser systems. These technologies will be applied for offshore oil & gas development in developing countries. Our final goal is make a proposal of ocean technology policy in comprehensive and systematic fashion.	1) Ocean renewable energy 2) Ocean current 3) Offshore engineering	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 already showed that our proposed system can be stably moored by a single mooring system with weathervane functions, and demonstrated by a 1/3 scale model in water of off Kuchinoshima Island. However, we still have many concerns. One of measure concerns to commercialize the proposed system is whether the system has enough fatigue life or not in realistic ocean current which has a small fluctuations. To give an answer to this question, we have conducted an ocean current measurement at sea as well as a numerical simulation of the turbine load. We will analyze these data to reveal the influence of the turbulent nature of the inflow in which summer program students can participate. It is preferable if program students have knowledge of fluid dynamics and/or dynamics of rigid bodies. However, all student who are strongly wiling to study the marine renewable energies can participate.