

## 2<sup>nd</sup> International Conference & Expo on **Green Energy, Recycling & Environmental Microbiology**

November 28-30, 2016 Atlanta, USA

### Development of a floating ocean-current turbine for the Kuroshio Current

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Ocean currents have an important potential for future renewable energy. Japan is in suitable location for harnessing the power of ocean currents because the Kuroshio Ocean Current runs steadily near the Japanese seaside. The Kuroshio Current is a strong ocean current in the western North Pacific Ocean. The current flow is approximately 500 m deep and 100 km wide with a flow speed of 1-1.5 m/s. This seems to be rather slow flow, but it is sufficient for generating electricity because the water density is 800 times higher than air. In order to harness the kinetic energy of ocean currents, we propose a novel ocean-current turbine. The turbines are moored to the seabed and function like kites in the water flow. To operate a turbine at the middle layer of a marine current, it is necessary to cancel the rotor torque. Therefore, our turbine is designed with a float at the top and a counterweight at the bottom. Owing the buoyancy and gravity, the turbine maintains a stable body. In this presentation, we describe laboratory and at-sea towing experiments and show that results confirm the float and counterweight configuration's high hydrostatic stability and reliable electric power generation.

#### Biography

Katsutoshi Shirasawa is a Staff Scientist of the OIST (Okinawa Institute of Science and Technology Graduate University). He has received his PhD from Hiroshima University in 2004. His thesis focused on the polarization control using insertion device in soft X-ray region. After graduation, he joined the Japanese X-ray Free Electron Laser Project. In 2012, he joined the OIST and started R&D work on an Ocean-current Turbine.

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