Contribution ID: **136** Type: **Poster Presentation**

Experiments about discharge in water with changing conductivity and applied voltages

Friday, 8 July 2016 14:40 (20 minutes)

A large volume plasma with streamers is generated around an electrode with a sharp edge when a pulsed high voltage is applied to the electrode in water. Discharge in water is applied to the industry such as improving water quality. However, some of discharge mechanism in water has not been cleared. In this study, we generated the discharge in water with changing the water conductivity, measured waveforms and took pictures of discharges. Plasmas in water were generated around a copper electrode of 0.8 mm in diameter covered by an insulator of 2.2 mm. Plasmas were positive polarity. The current and voltage waveforms of the discharge were measured by a high voltage probe (Tektronix Model P6015A) and current monitor (Pearson Model 101). The conductivity was changed from 110 to 1500 μS/cm for analysis of plasma formations with current and voltage waveforms. Pictures of the discharge were taken by a single-lens reflex camera and a high speed camera. Our work has two purposes for analysis of plasmas in water. First, the current was proportionally increased when the conductivity was increased and shapes of plasma were also changed. The progress distance of streamers was shorter when the conductivity is larger. However, the emission of light on plasma was increased. Next experiment was change the applied voltage, and considerations how to generate discharges. The applied voltage related to the discharge probability. In the low applied voltage, discharges had like grain of light at the tip of streamer in almost all pictures. The grain may be small babbles in the water, and the progress of plasmas grew to small bubbles. Our experiments about changing conductivity and applied voltages will be fundamental data for some applications of discharge in water.

Primary author: FUE, Masatoshi (iwate university)

Co-authors: Prof. AKIYAMA, Hidenori (Kumamoto university); AKIYAMA, Masahiro (Iwate Univercity); OGATA, Ryoma (iwate university); OIKAWA, takuma (Iwate university)

Presenter: FUE, Masatoshi (iwate university)

Session Classification: Poster 3-A

Track Classification: Plasmas, Discharges, and Electromagnetic Phenomena