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**Potential Structure Formation in the Gas-Liquid Interfacial Plasmas**<sup>1</sup> TOSHIRO KANEKO, TAKASHI HARADA, QIANG CHEN, RIKIZO HATAKEYAMA, Department of Electronic Engineering, Tohoku University — Specific kinds of plasmas composed of ionic liquids and gas phase discharge plasmas are created. These novel gas-liquid interfacial plasmas could contribute to the effective creation and modification of nano-bio materials, where the control of ion behavior in both the gas and liquid phases is desired. In this study, the plasma source containing the ionic liquids is developed for clarifying the effects of the ionic liquids on the plasma generation and the potential structure formed in the gas-liquid interfacial region is investigated for controlling the ion motion. A direct current (DC) or a pulsed DC discharge plasma is generated just above the ionic liquid by applying the DC or the pulsed DC voltage to an electrode immersed in the ionic liquid against a grounded electrode set in the gas phase region. The precise potential structure between these electrodes through the gas-liquid interfacial region is clarified, and the dynamics of the plasma ions is found to be controlled using the sheath electric field in the interfacial region. The control of the plasma ion irradiation flux and energy to the ionic liquid leads to the creation of various kinds of nanoparticles.

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