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Development of an Air Plasma Driven by Energy Controlled DC Pulse CHANG-SEUNG HA, DONG-HYUN KIM, HAE JUNE LEE, HO-JUN LEE[1], SANG RYE PARK, GYOO CHEON KIM, Pusan Natl Univ — An atmospheric pressure plasma jet driven by energy controlled DC pulse has been developed. In the previous study, we showed that Ar and He plasma jet was successfully generated and well controlled by proposed method with relatively low DC voltage (∼800 V)(1). In this study, the DC pulse is raised to 2 kV using DC-DC converter and switching device, and the plasma is generated under air flow condition. This air jet plasma device adopt dielectric-free metal electrode with externally controllable ballast capacitor. The plasma can stably and precisely be controlled by voltage and capacitance of ballast capacitor. It is shown that operation regime of the air plasma jet can be varied from the glow mode to the near-arc. The electro-optical characteristics such as voltage and current waveforms, optical emission spectra, and ICCD images were investigated. As an application of proposed plasma source, study on the cancer cell treatment was performed. It is observed that the death of oral squamous cell carcinoma (SCC25) cell is caused by exposure of air plasma jet. This result demonstrates the potential of the proposed plasma source for skin or oral cancer treatment. (1) C-S Ha *et al.*, Proceedings of 37^{th} ICOPS, 20-24 June 2010

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