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臺灣大學應用力學研究所
演 講 公 告

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主 講 人：鄭雲謙副教授
　　陽明交通大學機械工程學系

講　　題：非熱平衡大氣電漿系統與人工智慧分析

摘　　要：　如附件

主 持 人：　陳國慶所長

時　　間：　112年10月30日（星期一）下午2時20分開始

地　　點：　臺灣大學應用力學研究所國際會議廳

☆☆ 歡迎聽講，敬請張貼 ☆☆

Circuits and Flow-mixer Design of Atmospheric-pressure Plasma for Medical Applications

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ABSTRACT

We compared the effects of plasma with thermal therapy on lung cancer with malignant pleural effusion. This study find out that the plasma can selectively kill lung cancer cells and the benign cells remain its viability. Besides, the thermal therapy kills both cancer cell and benign cells. To investigate what is the plasma factor that inhibits cancer cells, we investigated the effects of plasma-generated short-lived species, long-lived species, and electric fields on skin melanoma and basal cell carcinoma cells (A2058 cells, BCC cells) and normal cells (BJ cells, Detroit 551 cells) and found that the short-lived species do make selective inhibition to the benign and malignant cells. The second part of my study is that we mix water aerosol with plasma jet at downstream region makes the plasma jet generate more • OH. We designed different mixing chambers and adjusting the water aerosol flow rate maximize the • OH generated by plasma jet for biological applications. We also constructed an impedance matching circuit for a partial-discharge calibrated (PDC) atmospheric-pressure plane-to-plane DBD equivalent circuit. The last part of my work is that we used machine learning to distinguish the discharge current of different plasma. The plasma discharge can be different depending on the conditions, and the resulting discharge current has quite different electrical features. Hence, a real-time and cost-effective diagnosis of atmospheric-pressure plasma discharge can be possibly provided via current classification with deep learning model.