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Treatment of liquids by low-current arc in ambient air for biomedical and agricultural applications VLADISLAV GAMALEEV, NAOYUKI IWATA, Meijo University, JUN-SEOK OH, Osaka City University, MINEO HIRAMATSU, MASAFUMI ITO, Meijo University — Recently plasma treated water (PTW) is attracting a lot of attention owing to a huge number of possible applications in agriculture and medicine. Typically a low temperature atmospheric pressure plasma jets (APPJ) or dielectric barrier discharges (DBD) are used for treatment of water. However, in both cases of APPJ and DBD, production rate of RONS is low and irradiation of liquid takes a long time. In this work we developed compact generator for direct treatment of liquids by ambient air low-current arc (AALCA), which allows to perform treatment of any type of liquid regardless of its conductivity. It was found that treatment by AALCA is extremely efficient for delivery of reactive species to the liquid and concentrations of RONS after the treatment are several hundred times higher comparing to conventional APPJ and DBD plasma. It was confirmed by survival test of E.coli that produced PTW is having a strong bactericidal effect which remains event after storage of PTW for several days. Simple setup, cheap price and possibility of scaling are looking perspective for development of a tool for plasma treatment of large volumes of water which could be used in agriculture and medicine. In the presentation, plasma generation process and parameters of the plasma, the quantitative measurement of RONS delivered from the plasma and applicability of proposed method in agriculture and medicine will be demonstrated.

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