

Abstract Submitted
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Investigation of plasma dynamics in a packed bed plasma reactor (PBPR)¹ ZAKA UL ISLAM MUJAHID, Department of Physics, Faculty of Science, Jazan University, Jazan 45142, Saudi Arabia, AHMED HALA, King Abdulaziz city for science and technology (KACST), Riyadh, Saudi Arabia — Packed bed plasma reactors (PBPR) are very promising for abatement of environmental pollutants and hydrocarbon gas conversion. Several computational studies have extensively investigated the plasma formation in a PBPR, however the exact details about plasma dynamics are still unknown. In this work, we have studied the phase synchronized space and time resolved emission from a packed bed DBD, using an ICCD camera from two different axis i.e. top, through a transparent electrode and the side between the two electrodes. It was found that the plasma dynamics change with the applied voltage and power. The time resolved current shows that in each half cycle of the applied voltage, multiple discharge current pulses can be generated. It was observed that the first current pulse in each half cycle generates a filamentary discharge. The subsequent pulse generates surface ionization waves over the surface. All the following current pulses generate intense plasma at the contact points between the dielectric pellets. The study validates the modeling expectations of the major role of intense electric field at the contact points.

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