PPPS 2019



Contribution ID: 1299

Type: Oral

PULSED POWER AND TRANSIENT PLASMA WITH BIOMEDICAL, DEFENSE, ENERGY, AND ENVIRONMENTAL APPLICATIONS

Monday 24 June 2019 08:15 (1 hour)

This talk will review a university program that overlaps pulsed power and plasma science, and will describe applications to industrial, environmental, biomedical and defense problems. It will present some background for the development of the research, and the ideas underlying transient plasma, or plasma in a formative phase, which is key to some of these studies. Transient plasma can produce volume ignition of various fuels and engines with lower energy cost, for example, considerably reduced delay to ignition in pulse detonation engines, higher peak pressure for internal combustion engines, and improved energy efficiencies in emissions abatement. Biomedical applications include studies of nanosecond pulsed electric fields for the induction of programmed cell death in cancer cells in vitro and in vivo which have led to animal studies conducted with catheter-based pulsed power delivery systems, and the formation of commercial entities translating the research to medical applications. Finally, a project (tenuously connected to pulsed power) to foster and encourage interest in science and engineering and improve perceptions of science in society through movies will be described.

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Track Classification: Plenary Talk