K 4 Pulsed Power Technologie II

Zeit: Mittwoch 10:15–11:00 Raum: HU 3038

Hauptvortrag K 4.1 Mi 10:15 HU 3038

COMPACT PULSED POWER: SWITCHES, PHYSICS, AND TWO APPLICATIONS — •Martin Gundersen — University of Southern California, Los Angeles, California, 90089-0271

This talk will describe research into compact pulsed power, and two applicartions: flame ignition and medicine. Pulsed power that is compact, robust, and repetive, remains an elusive goal - notwithstanding modern advances in technology and fabrication. Switches are one of the keys to improved pulsed power teechnology.

This talk will review pseudospark and BLT switches, which are thyratron-like pulsed power switches in certain respects, but which are distinct in the mode of operation of the cathode. The remarkable physics associated with cathode emission will be discussed. An application of pulsed power to ignition and combustion of fuels, involving production of an unequilibrated plasma for ignition, will be described. Recent results for the ignition of pulse detonation engines, wherein greatly reduced delay to ignition was achieved without greatly increased energy, will be presented. The second application will describe the use of short pulse electric fields to induce programmed cell death, or apoptosis, and other intracellular effects in cells including human lymphocytes. This work has potential applications for cancer and gene therapy. Directions for future research will be discussed.