Abstract Submitted
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High Pressure NEQ Plasma Formation by Non-Self-Sustained Repetitively Pulsed Discharges WALTER LEMPERT, ADAM HICKS, MUNETAKE NISHIHARA, SETH NORBERG, J. WILLIAM RICH, IGOR ADAMOVICH, Ohio State University — We describe generation of large volume ($\sim$ 1-2 cm dimension) stable, high pressure non-equilibrium plasmas, utilizing non-self sustained repetitive high voltage pulsing. Ionization is created by means of $\sim$ 10 KV – 10 nsec duration pulses, repeated at 100 kHz repetition rate. In between the high voltage pulses, the plasma is sustained by application of a relatively low DC or RF field, in which the reduced electric field, E/n, is selected to optimize energy loading into desired molecular degrees of freedom. Detailed measurements of i-V characteristics, plasma lifetime, and heavy species temperature will be presented, along with recent results documenting creation of large ($\sim$5% or more) fractional excitation of O_2 into the metastable "single delta" electronic state, which is the upper lasing level for the oxygen – iodine laser. Demonstration of turbulent supersonic boundary layer control using Lorentz forces will also be presented.

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