

Abstract Submitted
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Pulse Discharge in Mixing Layer of Reacting Gases¹ SERGEY LEONOV, YURI ISAENKOV, JIHT RAS, MICHAIL SHNEIDER, Princeton University, JIHT RAS TEAM, PRINCETON UNIVERSITY TEAM — A subject of consideration is the dynamic of filamentary pulse discharge generated along contact zone of two co-flown gases. Experimental facility consists of blow-down wind tunnel PWT-50, system of the high-voltage pulse-repetitive feeding, and diagnostic equipment (schlieren device; pressure, voltage, current, radiation sensors; spectroscopic system; etc.) Typical parameters: $p=0.2-1\text{Bar}$, velocity $M=0-2$, pulse duration $\tau=0.1-1\mu\text{s}$, power release $W=20-100\text{MW}$. Recently the effect of enormously fast turbulent expansion of the post-discharge channel was observed experimentally [S. Leonov, oth., AIAA Paper 2005-0159 and S. Leonov, oth. "Physics of Plasmas", v.15, 2007]. In this paper a result of parametrical study of the mixing efficiency due to instability development are discussed. The next announced item is that the discharge position and dynamics depend on the test parameters and physical properties of gases involved. The result of interaction can be controlled by the discharge's duration and current as well as by small additives to the gas. The effects found can be applied for high-speed combustion enhancement due to mixing acceleration in multi-components flow..

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