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Transverse Gas Flow RF Slab Discharge Generator of Singlet Delta Oxygen for Oxygen-Iodine Laser ANDREY IONIN, YURII KLIMACHEV, OLEG RULEV, LEONID SELEZNEV, DMITRY SINITSYN, Lebedev Physical Institute of Russian Academy of Sciences, IGOR KOCHETOV, ANATOLY NAPARTOVICH, TRINITI, LEBEDEV PHYSICAL INSTITUTE OF RUSSIAN ACADEMY OF SCIENCES TEAM, TRINITI TEAM — Results of experimental and theoretical study of singlet delta oxygen (SDO) production in transverse gas flow RF slab discharge for an electric discharge oxygen-iodine laser are presented. The electric discharge facility operating in both pulse-periodic and CW mode was manufactured: gas flow duct including multi-path cryogenic heat exchanger, dielectric slab channel, and slab electrode system incorporated in the channel for RF discharge ignition. Experiments on SDO production in transverse gas flow RF discharge were carried out. SDO production depending on gas mixture content, gas mixture, gas flow velocity, low-frequency modulation of RF power and RF discharge power was experimentally studied. It was shown that SDO yield increased with gas pressure decrease, gas flow deceleration and helium dilution of oxygen at the same input power. CW RF discharge was demonstrated to be the most efficient for SDO production at the same averaged input power of RF discharge. SDO yield was demonstrated to be not less than 10 percent.

Andrey Ionin
Lebedev Physical Institute of Russian Academy of Sciences

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