

DEPENDENCE OF THE EFFICIENCY OF EXCIMER
GAS-DISCHARGE LASERS ON PARAMETERS
OF THE EXCITATION CIRCUIT
AND THE ACTIVE MEDIUM

*A.M. Razhev, A.A. Zhupikov, A.G. Kalyuzhnaya¹,
A.I. Shchedrin¹*

Institute of Laser Physics,
Acad. Sci. of Russia, Siberia Division
(13/3, *Laurent'yeva Prosp.*,
Novosibirsk 630090, Russia),

¹Institute of Physics, Nat. Acad. Sci. of Ukraine
(46, *Nauky Prosp.*, *Kyiv 03028, Ukraine*)

S u m m a r y

We present the theoretical and experimental results of studies of the influence of parameters of the excitation system and the active medium on the radiant energy and efficiency of a KrF laser. An *LC*-inverter excitation circuit with a sharpening capacitor, the automatic UV preionization, and a spark gap used as a high-voltage switch is analyzed. The optimal parameters of elements of the excitation circuit are found, which provides the pumping intensity approximately equal to 4 MW/cm^3 . It is discovered that the increase in the pumping level yields a rise of both the total pressure of the active medium and the active volume due to an increase of the discharge width. A comparison of the results obtained for KrF and ArF lasers testifies to the fact that the dependences of the discharge and radiation characteristics on the parameters of the excitation circuit have a universal form.