

《中国激光》1987年(第14卷,总121~132期)总目录

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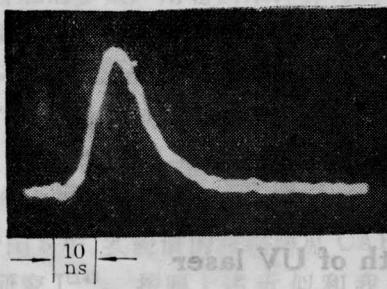


图 5 N_2 , $P=150$ Torr, $P_{N_2}=3$ atm

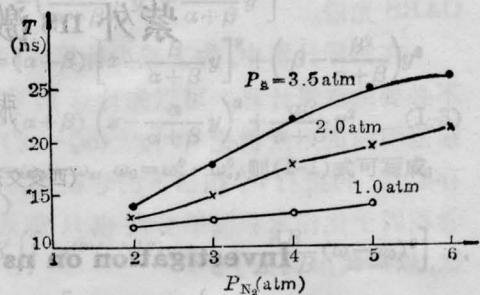


图 7 半脉宽 T 与球隙气压 P_{N_2} 关系 (工作气体 $XeCl$)

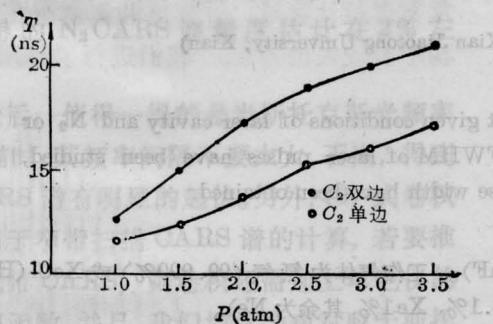


图 6 半脉宽 T 与腔内总气压 P 的关系 (工作气体 $XeCl$)

当工作气体为 $XeCl$ 时, 通过增加 Ne 成份提高腔内气压, 使之在 $1\sim3.5$ atm 之间变化, 球隙气压仍为 $2\sim6$ atm 之间。测得输出脉冲半宽度与腔内气压及球隙气压的关系曲线如图 6、图 7 所示。图 8 为 $XeCl$ 气体时的典型波形。

很明显, 当 N_2 作为工作气体时和 $XeCl$ 为工作气体时, 脉宽随腔内气压变化的趋势是相反的。这个不同点可以由帕邢曲线得到解释。由于 N_2 的工作气压较小, $p \cdot d$ 值处在帕邢 U 形曲线的左边, 而 $XeCl$ 工作气压在几个大气压之间, 因而 $p \cdot d$ 值处于 U 形曲线的右边。

由上面的结果可以得出:

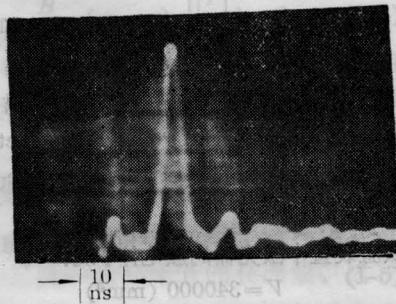


图 8 $XeCl$, $P=2.5$ atm, $P_{N_2}=4.0$ atm

1. 单边结构的输出半脉宽比双边结构小;
2. 随球隙气压增大, 输出激光半脉宽也增大;
3. 当 N_2 为工作气体时, 随腔内气压的增大, 半脉宽逐渐减少。当 $P=150$ Torr 时, 获得单边回路半脉宽为 5 ns, 双边回路半脉宽为 5.8 ns 的激光。
4. 当 $XeCl$ 为工作气体时, 随着腔内气压 P 增大, 半脉宽也增大。气压为 1 atm 时, 获得最窄激光脉冲, 单边时 $T=11.7$ ns; 双边时, $T=12.7$ ns。

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