

Tunable RF-Excited Z –Fold Waveguide CO₂ Laser With Common Electrodes

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Abstract

The design and performance of radio frequency (RF) excited partial Z-fold waveguide CO₂ laser with two channels are exposed. The electrodes for the two channels are common and excited by a same RF source .According to our analysis, this kind of structure can greatly improve the laser offset frequency stability. In the experiments, we studied the offset signal of laser form with two channels and the deviation of offset frequency in long term.

Keywords: Waveguide CO₂ laser, Offset frequency, RF discharge, Common electrodes.

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Introduction

CO₂ waveguide laser has been found widespread applications as a compact infrared source in portable systems. At present, high-power CO₂ laser is used widely in industry, military, and metrology [Pearson 1992, Tian 2002, Ma 1994, Xin 1996]. Up to now, most of CO₂ coherent laser radars utilize two lasers with different wavelengths. But this may suffer from possibly unacceptable penalties of increased size, weight, complexity, and cost [Fox et al 1989]. However, a single radio frequency (RF) source may be used to excite two laser channels.