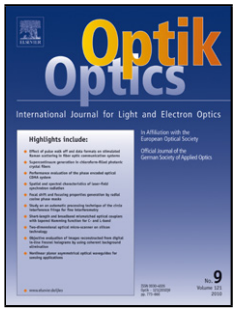

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PII: S0030-4026(18)30771-X
DOI: https://doi.org/10.1016/j.ijleo.2018.05.120
Reference: IJLEO 60983

To appear in:

Received date: 11-4-2018
Accepted date: 26-5-2018

Please cite this article as: Wang J, Li Q, Zheng Q, Chen X, 430nm DPSS blue laser generated by sum-frequency mixing, *Optik* (2018), https://doi.org/10.1016/j.ijleo.2018.05.120

430nm DPSS blue laser generated by sum-frequency mixing

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Abstract: An all-solid-state blue laser at 430nm generated by intracavity sum-frequency mixing of a Nd: YAG laser emitting at 1319nm and a Pr:YLF laser at 639.5nm is presented. The continuous output power of 430nm is over 190mW which is the highest laser power emitting at this wavelength according to current report. The Nd: YAG and Pr:YLF crystal was pumped by a 5.9W 808nm and a 3.0W 444nm laser diode respectively. The optical-to-optical conversion efficiency is 2.1%.

Keywords: 430nm blue laser; diode-pumped; sum-frequency generation; solid-state laser; visible laser

Introduction

In recent years, laser light sources in the visible region is required by the fields of biomedicine, display technology, communications etc. In particular, the blue lasers among them are quite important for many applications including information storage, spectroscopy and optical image. So they are attracting a lot of researchers [1].

Before the development of all-solid-state laser technology, 430nm blue laser is primarily diode laser pumped by electricity which has large beam divergence angle, and the directionality and monochromaticity are not so good[2,3]. Researchers have found other ways to get the blue light at