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Design of a solar-pumped frequency-doubled 532 nm Nd:YVO₄ laser

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This study has focused the design, development and demonstration of a frequency-doubled 532 nm Nd:YVO₄ laser pumped by solar light. The solar pumped laser is consisted of the optically contracted Nd:YVO₄ crystal and KTP crystal with a system of laser mirrors deposited onto crystal sides. The design is aimed to achieve the laser emission using the direct end-pumping approach. In addition, the solar tracking system is developed to orient the sunlight collecting system toward the sun. The measurement of the power distribution along the laser crystal is discussed. Furthermore, a novel design of an optical filter is proposed to diminish the heat load into the laser crystal. This solar pumped laser system is appealing for a variety applications including laser communication, imaging and defense applications.

Keywords: Lasers , Solar pumped laser, Optically pumped lasers

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