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DPAL pump system exceeding 3kW at 766nm and 30 GHz bandwidth
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ABSTRACT

Due to their low quantum defect, diode pumped alkali metal vapor lasers (DPALs) offer the promise of scalability to very high average power levels while maintaining excellent beam quality. Research on DPALs has progressed to ever increasing power levels across multiple gain media species over the last years, necessitating pump power in the kW range. Each material requires a specific pump wavelength: near 852nm for cesium, 780nm for rubidium, 766nm for potassium, and 670nm for lithium atoms. The shorter pump wavelengths below 800nm are outside the typical wavelength range for pump diodes developed for diode pumped solid state lasers (DPSS).

A major challenge in pushing these systems into the kW range is maintaining the system gain media above a self-amplified spontaneous emission (SASE) threshold. This paper reports on a novel DPAL system that uses a novel gain media and a novel pump source to overcome this challenge. The system is based on a novel gain media and a novel pump source that uses a novel gain media and a novel pump source.

The focus of this work is the development of a DPAL system that uses a novel gain media and a novel pump source. The system is based on a novel gain media and a novel pump source that uses a novel gain media and a novel pump source.

Keywords: Diode pumped alkali metal vapor laser, DPAL, 3kW, 766nm, 30 GHz, bandwidth, laser, alkali

1. INTRODUCTION

As outlined in the DPAL research strategy document from the Office of Naval Research, diode pumped alkali metal (DPAL) lasers are expected to offer a number of advantages over other laser technologies. In addition, the development of DPALs is expected to lead to a number of new applications in the fields of laser science and technology.

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DPAL Pump System Exceeding 3kW at 766nm and 30 GHz Bandwidth

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