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Improving the laser brightness of a commercial laser system

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Abstract content
 (Max 300 words)
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We explore a beam shaping approach inside a laser cavity to generate a Gaussian distribution by the metamorphosis of a Gaussian beam into a flat-top distribution on opposing mirrors. The concept is tested external to the laser cavity through the use of two spatial light modulators (SLMs), where the first SLM is used to transform a Gaussian beam into a flat-top distribution and the second SLM is encoded with the conjugate phase of the flat-top for conversion back to a Gaussian. We implement this intra-cavity selection through the use of two optical elements of the refractive variant that are designed from the phase profiles addressed to the SLMs. We consider a solid-state diode side-pumped laser resonator that consists of two planar mirrors where the refractive optics are positioned at the mirrors. We out couple the Gaussian and flat-top distributions and we show that we increase the energy extraction while maintaining a beam quality that is comparable to our predictions.

Apply to be considered for a student award (Yes / No)?

Yes

Level for award (Hons, MSc, PhD)?

PhD

Main supervisor (name and email) and his / her institution

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Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

No

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