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Intra-cavity metamorphosis of a Gaussian beam to flat-top distribution

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Abstract content ** ** (Max 300 words) **
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We explore an intra-cavity beam shaping approach 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 cavity through the use of two spatial light modulators (SLM), where the first SLM is used to transform a collimated Gaussian 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 beams and we show that we increase the energy extraction while maintaining a beam quality that is comparable to our predictions.

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