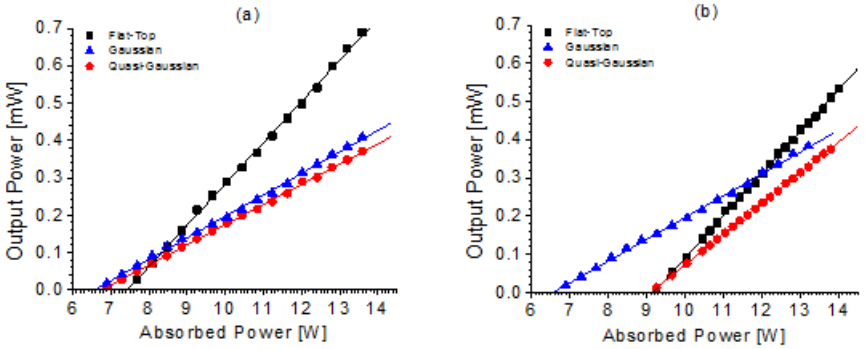

Fig. 5. The slope efficiencies of the FT beam, quasi Gaussian beam and Gaussian beam for (a) 20 μm and (b) 100 μm ring width.

Finally we point out that while we have used the digital laser to prove the principle, one would not use the intra-cavity SLM approach in a high power system. Rather, one would make use of custom optical elements to implement the ring aperture, thereby increasing the damage threshold and lowering the losses, to produce a more efficient and practical system.

4. Conclusion

In conclusion, we have conceived of and then demonstrated a novel laser cavity that is mode tuneable. We have shown that by simply adjusting the diameter of a standard circular aperture in the cavity, the mode can be selected from the ubiquitous Gaussian to a Flat-top beam. The ring mask was implemented with an intra-cavity holographic mirror for the convenience that this allows in testing the design parameters, but a high power version, optimised for power extract, would necessarily be made with standard optics and lithographic processing techniques to eliminate the SLM losses.

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