

4. Conclusions

In conclusion, we have demonstrated the first diode-pumped KLM Yb:YGG laser to the best of our knowledge. Pulses with a duration of 88 fs and an output power of 104 mW were obtained at a repetition rate of 159.3 MHz. This is, to our knowledge, the shortest result obtained from Yb:YGG laser up to now. In addition, we further compared the KLM laser characteristics of output powers and pulse durations under different transmissions, pulses with average power of 330 mW and duration of 149 fs were obtained. It shows that Yb:YGG is an excellent material for ultrashort pulse generation. Currently, limited by the cut-off wavelength of the cavity mirrors (1020 nm) and the GTI mirror (1035-1055 nm), the center wavelength of 1042 nm of the present spectrum is not coincided with the gain peak of the emission spectrum (1025 nm), which means that the gain bandwidth has not been fully taken advantage of. In next step, we would choose mirrors with suitable coatings to solve this problem. Meanwhile, we could optimize the intracavity dispersion compensation and the transmission of the output coupler, we believe that higher power and shorter pulse duration should be possible.

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