
Yb:S-FAP Multipass Side-Pumped Amplifier

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Acknowledgments:

US Air Force,

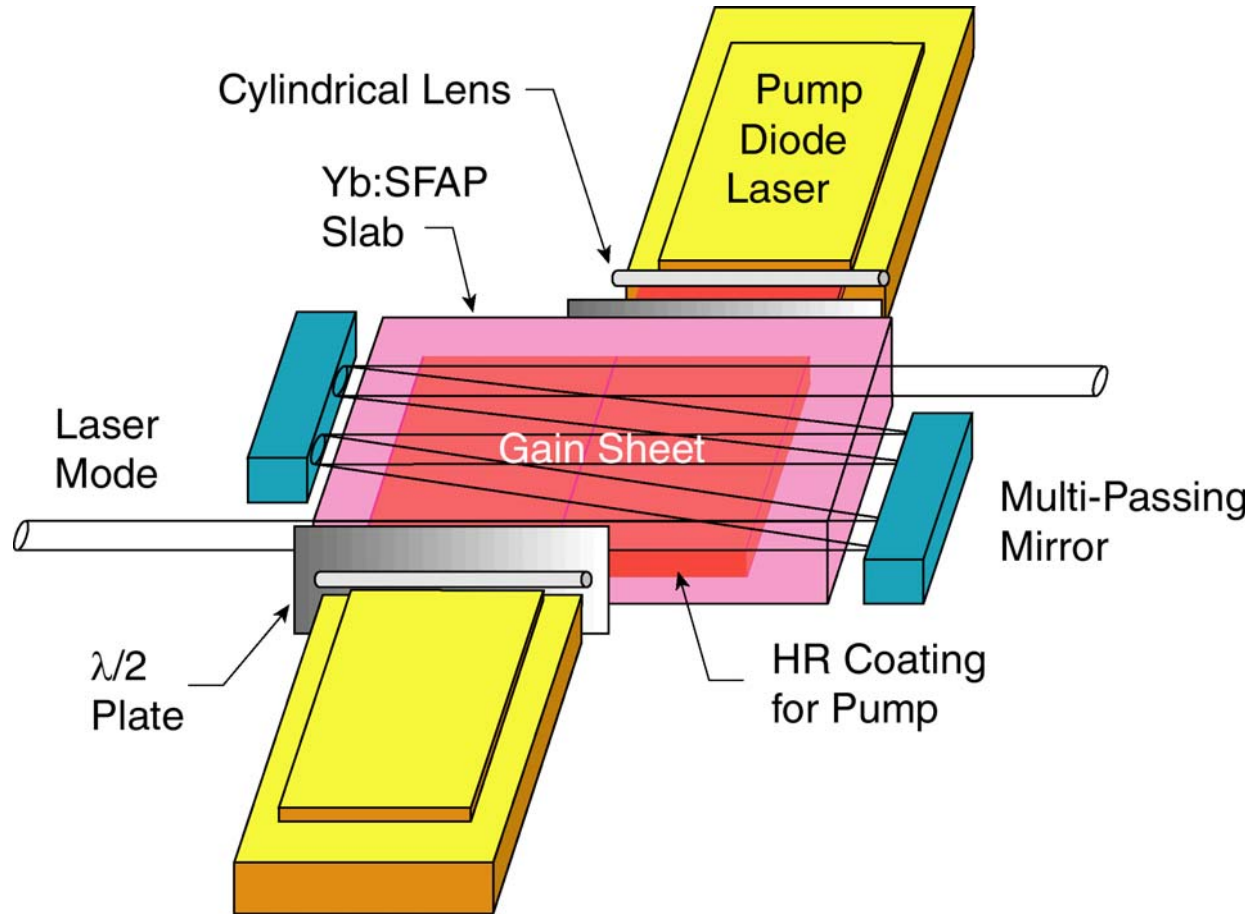
Contract # F29601-02-C-0011



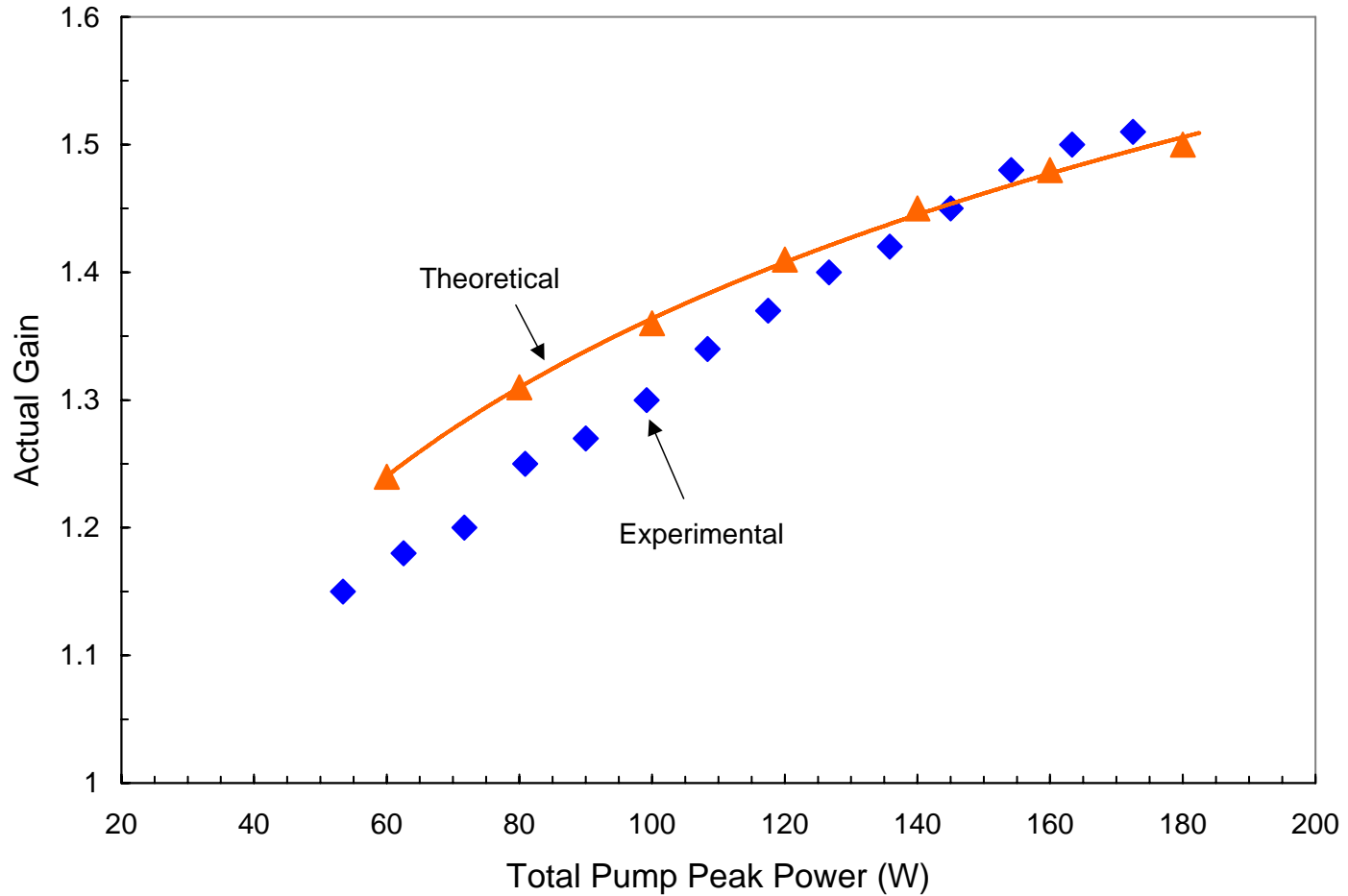
Abstract

We report a diode side-pumped, single-stage, multi-pass Yb:S-FAP amplifier designed to achieve high pump brightness, uniform absorption, and high amplification. We demonstrate highly efficient operation of the amplifier with an input signal from a Nd:YLF oscillator.

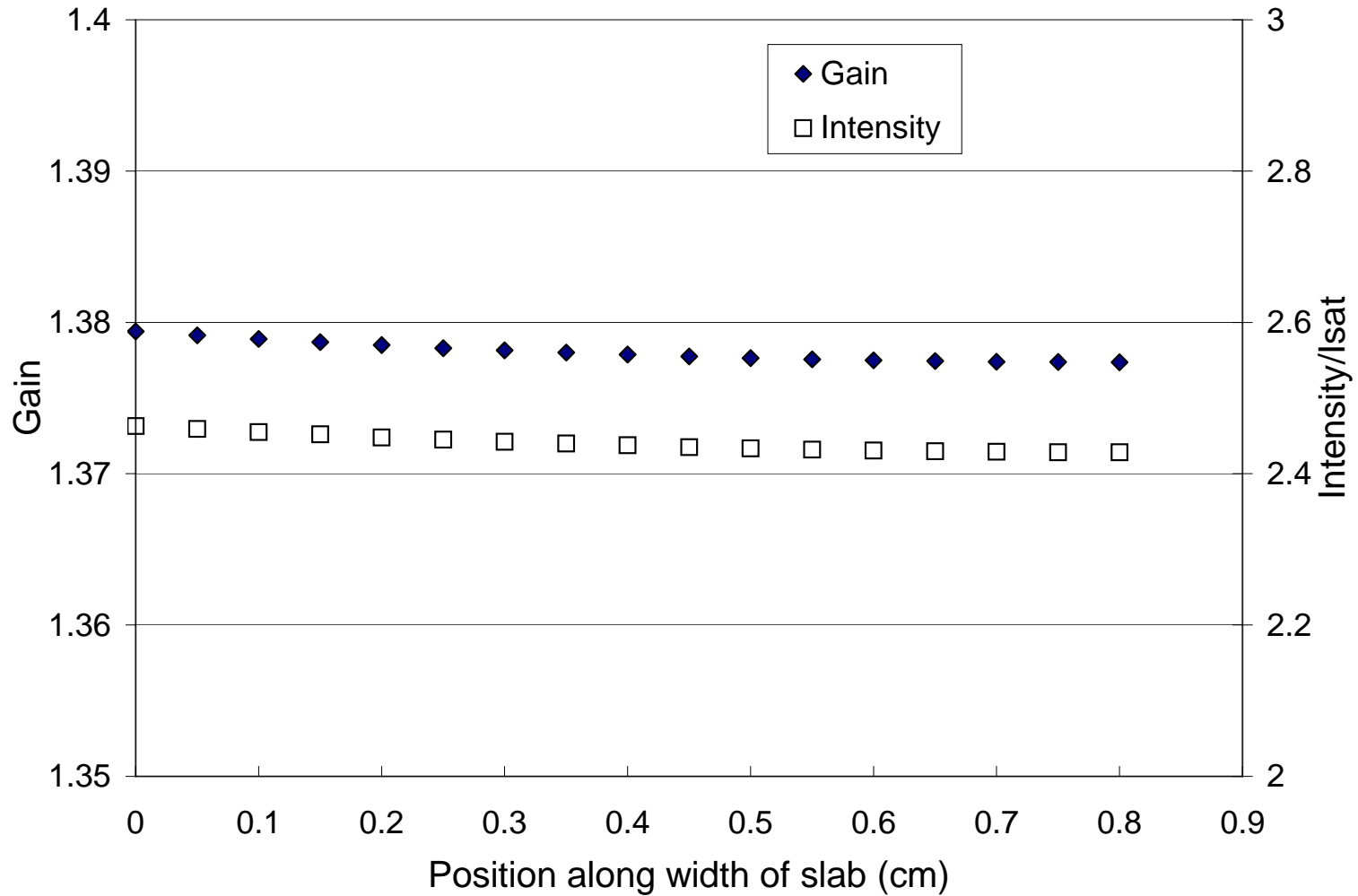
Schematic of the amplifier set up



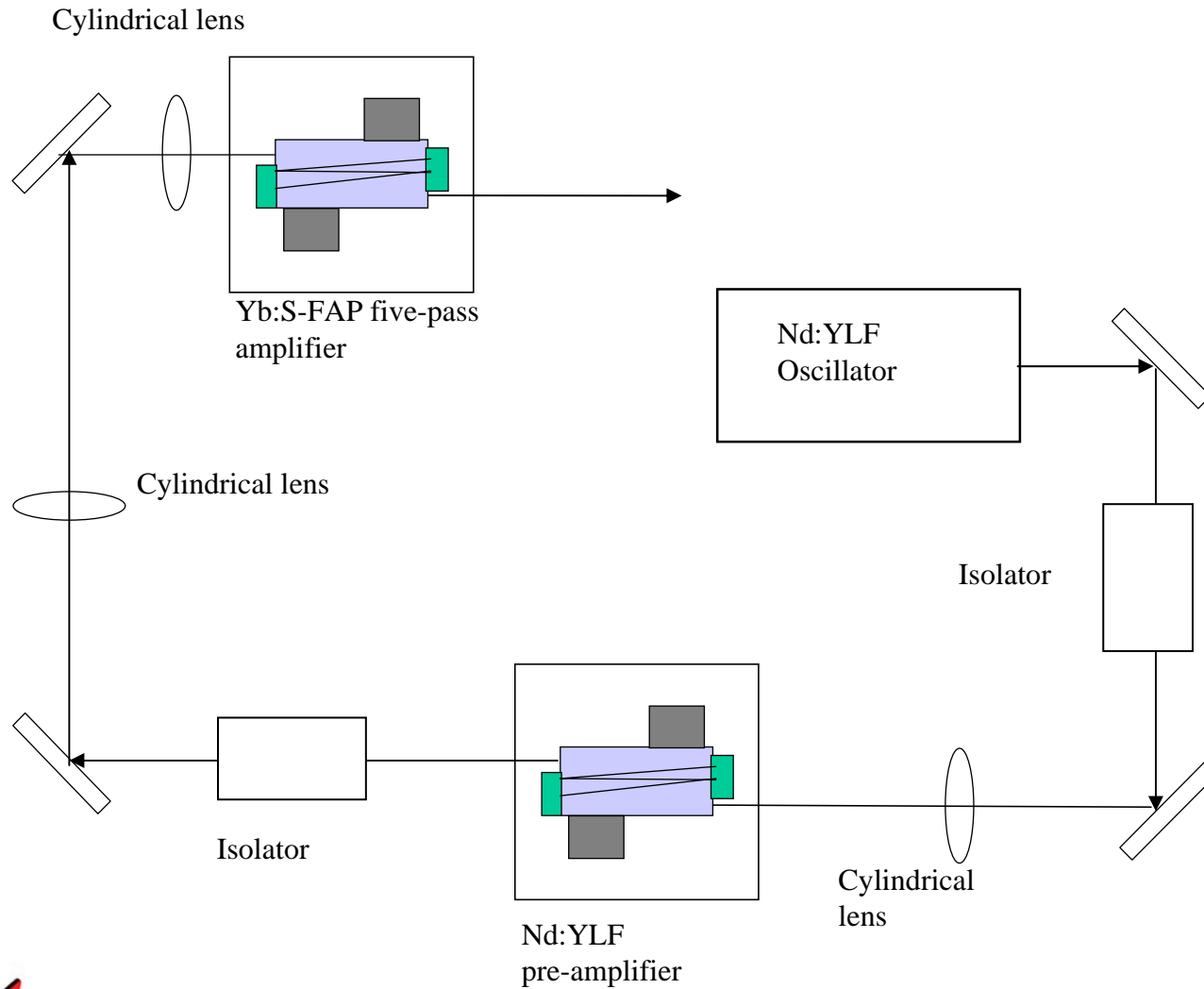
Single-pass Gain



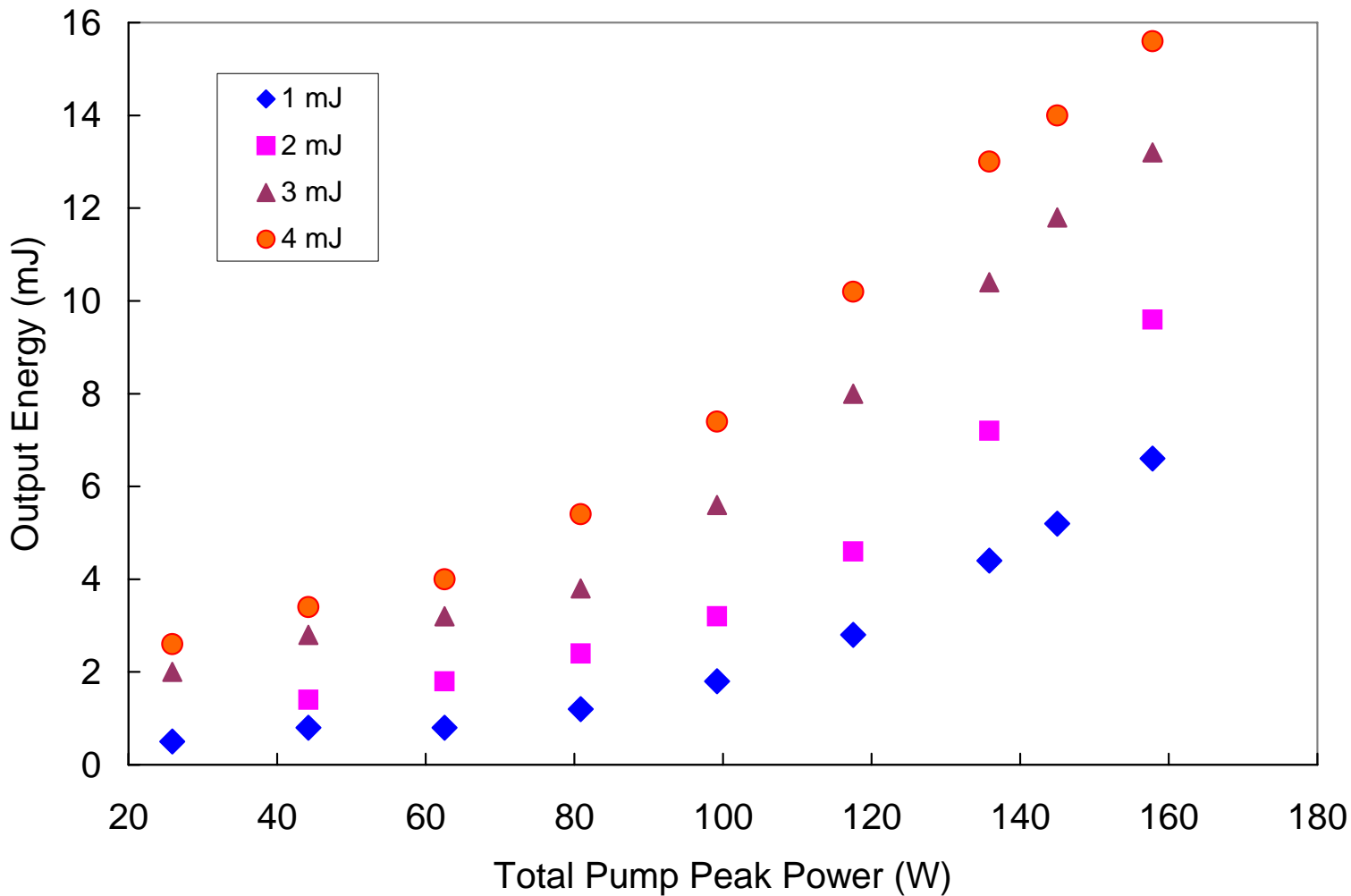
Calculated pump intensity and gain across the width of the slab



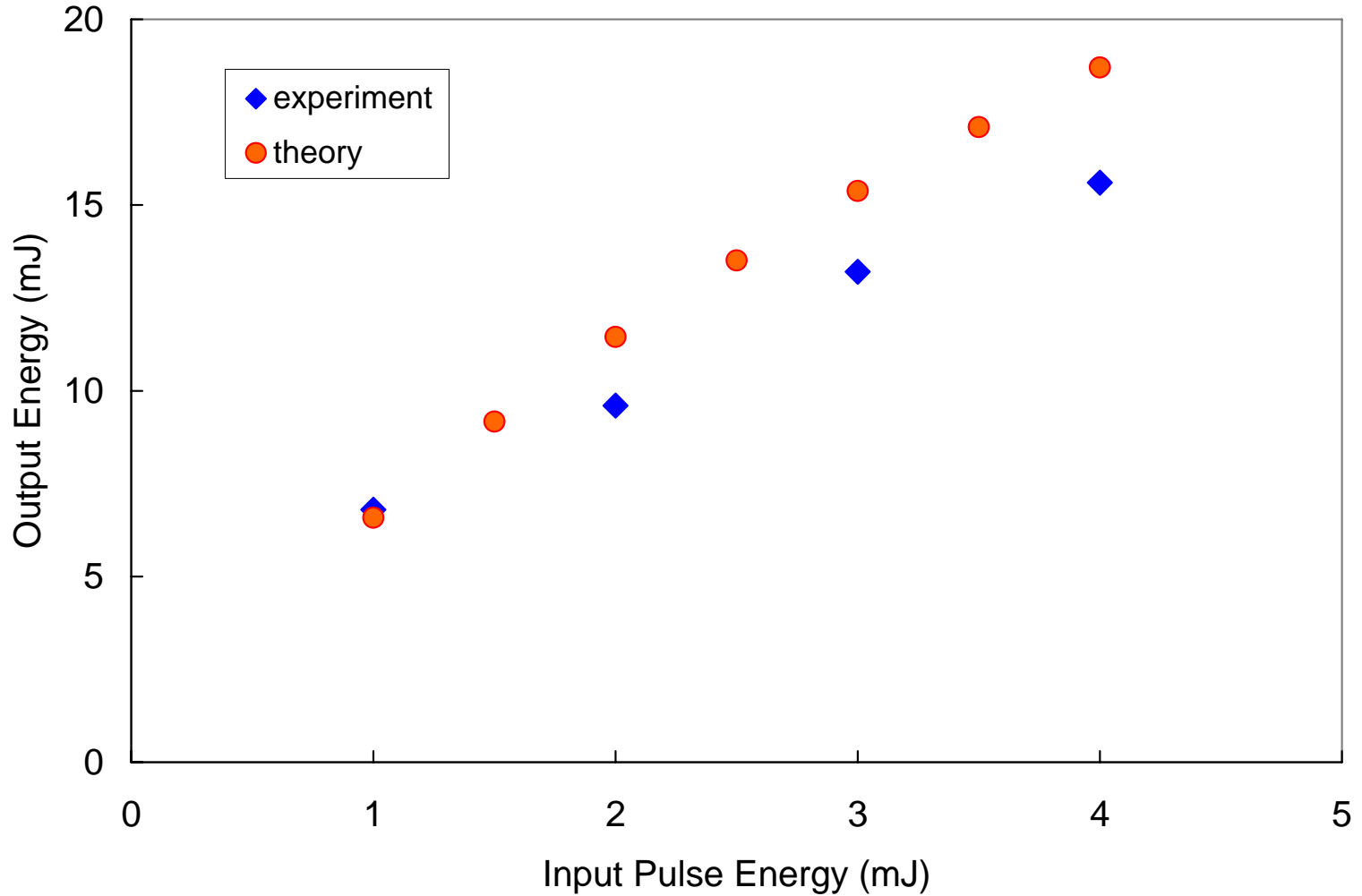
Experimental layout



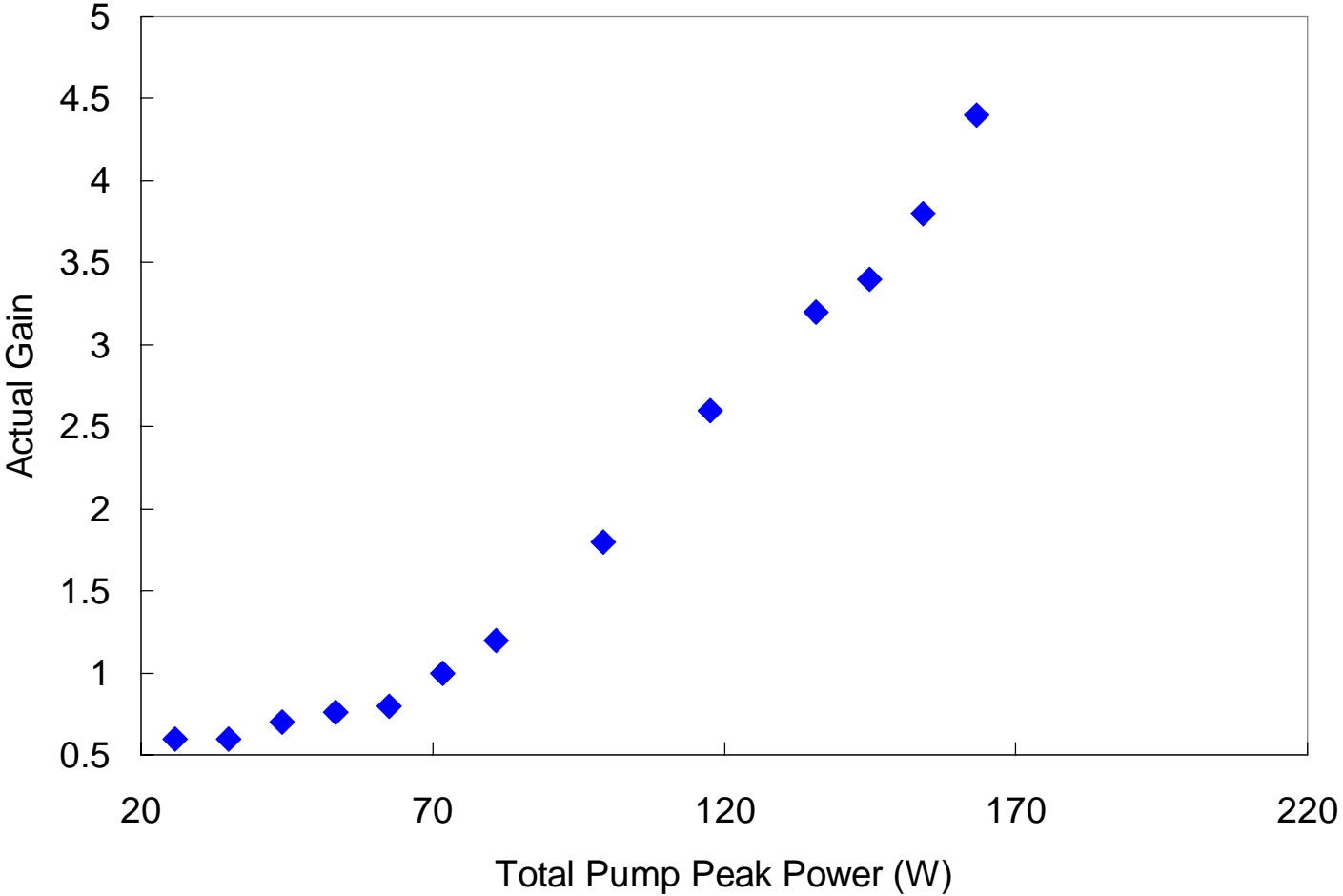
Output energy vs pump power at different input pulse energies for five-pass amplification



Five-pass amplification for different input pulse energies at total pump power of 160 W



Five-pass Gain



Conclusions

- We have demonstrated the first, to our knowledge, diode side-pumped, multi-pass Yb:S-FAP amplifier.
- Using quasi-CW diode lasers with peak powers of 80 W and pulse widths of 1.2 ms, we obtained a maximum slope efficiency of 14% with 16 mJ of energy per output pulse