

LASER TECHNOLOGY ASSOCIATES, INC.

Neodymium Laser Pumped Ytterbium Activated Erbium Doped Phosphate Glass Laser

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Abstract

Experimental results of direct optical pumping of the $^2F_{5/2}$ level of trivalent Ytterbium activated Erbium doped Phosphate Glass, lasing at 1.54um are presented

SUMMARY

- Increased pump absorption and decreased excited state can be achieved by decreasing the pump wavelength.
- Semiconductor diodes operating 970 nm will make an ideal, efficient pump source for $\text{Yb}^{3+}, \text{Er}^{3+}$: Phosphate Glass lasers.
- $\text{Yb}^{3+} \rightarrow \text{Er}^{3+}$ transfer efficiency is estimated to be less than 5% for QE-7 phosphate glass. A five-fold increase in the transfer efficiency can be achieved by increasing the Er^{3+} concentration in commercial laser glasses.
- A diode pumped $\text{Yb}^{3+}, \text{Er}^{3+}$: Phosphate Glass laser pumped at 970 nm and leaving an increased Er^{3+} concentration will produce an efficient, eye-safe laser with a wallplug efficiency greater than 5%