Principles of Lasers

Educator Kit ED-LASE

COMPREHENSIVE LABORATORY BASED EDUCATIONAL PACKAGE ON THE PRINCIPLES & CHARACTERISTICS OF LASERS

MAIN FEATURES AND BENEFITS:

- Provides all fibre optic hardware required to perform a detailed experimental investigation of fibre lasers
- Extensive literature support including: student and instructor's manuals with exercises, solutions & sample results
- Detailed lecture notes, tutorial examples and solutions to assist with the development of courses
- Saves significant course, literature and hardware development effort

THE EXPERIMENTAL INVESTIGATION* ADDRESSES:

- Construction of a fibre ring laser
- Measurement of lasing threshold
- Laser dynamics: relaxation oscillations, excitation lifetime, laser onset time
- Measurement of slope efficiency
- Effect of intra-cavity loss on the slope efficiency and threshold
- Influence of output coupling ratio on slope efficiency and threshold

*** Full details of the experiments and equipment specifications are provided overleaf**

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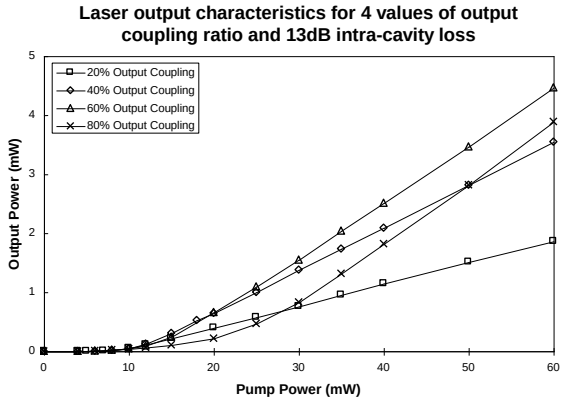
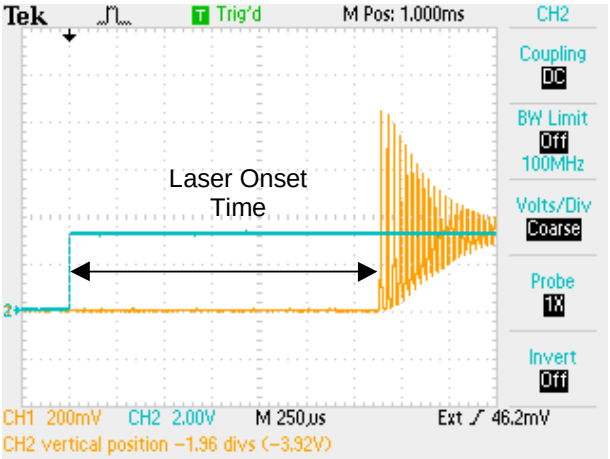
Laboratory Exercises

The ED-LASE educator kit enables students to construct an erbium doped fibre ring laser and conduct a detailed investigation into its performance, output characteristics and dynamic response. The ED-LASE experiments include:

- Construction and operation of an EDF ring laser



- Measurement of laser output power and gain as a function of pump power for various levels of intra-cavity loss.
- Measurement of laser output power and gain as a function of pump power for various values of the output coupling ratio.
- Investigation of slope efficiency and threshold as a function of intra-cavity loss.
- Examination of slope efficiency and threshold as a function of output coupling ratio.
- Measurement of relaxation oscillations for different pump powers, levels of intra-cavity loss and coupling ratios
- Investigation of the square of the relaxation oscillation frequency versus pump power in order to derive the excitation lifetime.



- Examination of laser onset time delay as a function of different pump powers, levels of intra cavity loss and output coupling ratios.

Product Description

The Principles of Lasers educator kit enables students to investigate the principles and characteristics of lasers using an Erbium Doped Fibre Ring Laser.

It comprises:

- An erbium doped fibre amplifier with 25dB small signal gain
- 70mW, 980nm pump laser diode with adjustable drive current, external modulation input and LCD power readout
- A set feedback couplers (20%, 40%, 60% and 80%) to alter the output coupling ratio (i.e. mirror reflectivities).
- An in-line external variable attenuator (0 to 30dB) to simulate intracavity loss.
- A bandpass filter ($\lambda_c \approx 1550$nm) to stabilise the laser operating wavelength and to suppress ASE power.
- An InGaAs photoreceiver module for output power measurements.
- All of the necessary fibre cable patchcords and adaptors to enable connection between the various units of the system.

In addition, a comprehensive literature package accompanies each kit:

- Student laboratory manual, describing the background theory and experimental procedure, with associated exercises to encourage the student to discuss the implications of their results.
- Instructor's manual dealing with all aspects of using the equipment and providing sample results for all the experiments and exercises.
- Extensive lecture notes on laser oscillator characteristics, fibre ring lasers and EDFAs.

Additional required equipment:-

- Signal/Function generator: 0-5V square wave output of 10Hz & 100Hz, DC offset capability.
- 2-channel laboratory oscilloscope, ≥20MHz b/w

Accessories

- Laser safety spectacles with OD3+ at 1550nm are available directly from OPTOSCI.

Ordering Information

ED-LASE	Principles of Lasers
SPECS	Laser Safety Specs OD3+ 1550nm

Since OPTOSCI are committed to continuously improving the design and performance characteristics of our products, these specifications are subject to change without notice.

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