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Abstract. A compact erbium-doped fibre (EDF) laser is demonstrated which uses a microfibre coupler and a highly concentrated EDF loop. The coupler functions to inject the pump light and tap out the output. The EDF laser operates at 1526.3 nm, with a signal-to-noise ratio of about 26 dB. The maximum output power 20 μ W is obtained at the pump power 18.6mW. We have obtained the slope efficiencies of the laser 0.12, 0.06, 0.04 and 0.02% at the EDF lengths fixed at 90, 78, 66 and 51 cm, respectively. The lowest lasing-pump power threshold is achieved at 3.8 mW

Keywords: microfibre, compact laser, erbium laser

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Анотація. З використанням мікроволоконного з'єднувача і високолегованої ербієм волоконної петлі в роботі досліджено легований ербієм компактний волоконний лазер.

Erbium-doped fibre ring laser based on microfibre coupler

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Abstract. A compact erbium-doped fibre (EDF) laser is demonstrated which uses a microfibre coupler and a highly concentrated EDF loop to inject the pump light and tap out the output. The EDF laser operates at 1526.3 nm, with a signal-to-noise ratio of about 26 dB. The maximum output power 20 μ W is obtained at the pump power 18.6 mW. We have obtained the slope efficiencies of the laser 0.12, 0.06, 0.04 and 0.02% at the EDF lengths fixed at 90, 78, 66 and 51 cm, respectively. The lowest lasing-pump power threshold is achieved at 3.8 mW.

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1. Introduction

Single-frequency lasers emitting light around 1550 nm are among the most important components in optical communication systems such as high-capacity wavelength division multiplexing (WDM) systems, externally modulated high bit-rate links [1–3]. Recently, single-frequency erbium-doped fibre (EDF) lasers have been shown to be suitable for applications in

З'єднувач використовувався для введення та виведення нагнітаючого оптичного випромінювання з волокна. Лазер функціонував на довжині хвилі випромінювання 1526,3 нм із відношенням сигнал/шум 26 дБ. Максимальна потужність лазерного випромінювання становила 20 мкВт за потужності випромінювання нагнітання 18,6 мВт. Коефіцієнт корисної дії лазера становив 0,12, 0,06, 0,04 і 0,02 % відповідно для довжин волоконного резонатора 90, 78, 66 і 51 см. Найнижче порогове значення потужності нагнітаючого випромінювання складало 3,8 мВт.

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