



FIBER AMPLIFIER DEVELOPMENT

First demonstration of a broadband 37-cell hollow core photonic bandgap fiber and its application to high capacity mode division multiplexing

Y. Jung, V.A.J.M. Sleiffer, N.Baddela, M.N. Petrovich, J.R. Hayes, N.V. Wheeler, D.R. Gra, E. Numkam Fokoua, J.P. Wooler, N.H.-L. Wong, F. Parminiani, S.U. Alam, J. Surof, M. Kuschnerov, V. Veljanovski, H.de Waardt, F. Poletti, and D.J. Richardson

OFC 2013, (Post deadline) paper PDP5A.3

Multimode EDFA performance in mode-division multiplexed transmission systems

Y. Jung, V. A. J. M. Sleiffer, B. Inan, M. Kuschnerov, V. Veljanovski, B. Corbett, R. Winfield, Q. Kang, A. Dhar, J. Sahu, F. Poletti, S. -U. Alam, D. J. Richardson

OFC 2013, Paper JW2A.24

Three mode Er³⁺ ring-doped fiber amplifier for mode-division multiplexed transmission

Y. Jung, Q. Kang, V.A.J.M. Sleiffer, B. Inan, M. Kuschnerov, V. Vejanovski, B. Corbett, R. Winfield, Z. Li, P. S. The, A. Dhar, J. Sahu, F. Poletti, S. U. Alam, and D. J. Richardson

Optics Express, 21 (8), 10383-10392, 2013.

Design of Four-Mode Erbium Doped Fiber Amplifier with Low Differential Modal Gain for Modal Division Multiplexed Transmissions

Q. Kang, E.L. Lim, Y. Jung, F. Poletti, S.U. Alam and D. J. Richardson

OFC 2013, Paper OTu3G.3.

Thulium-doped Fiber Amplifier for Optical Communications at 2 μ m

Z. Li, A. Heidt, J. Daniel, Y. Jung, S. Alam, and D. J. Richardson

OFC 2013, Paper OTh4C.1

Thulium-doped fiber amplifier for optical communications at 2 μ m

Z. Li, A. M. Heidt, J. M. O. Daniel, Y. Jung, S. U. Alam, and D. J. Richardson

Optics Express 21 (8), 9289–9297, 2013



Diode-pumped Wideband Thulium-doped Fiber Amplifiers for Optical Communications in the 1800 – 2050 nm Window

Z. Li, A. M. Heidt, S. U. Alam, N. Simakov, Y. Jung, J. M. O. Daniel, and D. J. Richardson

ECOC 2013, Paper Tu.1.A.2

All-fiber, Ultra-wide Band Tunable Laser Source at 2 μm

Z. Li, S. U. Alam, Y. Jung, A. M. Heidt, and D. J. Richardson

ECOC 2013, Paper P1.8

Vector Mode effects in Few Moded Erbium Doped Fiber Amplifiers

E. L. Lim, Q. Y. Kang, M. Gecevicius, F. Poletti, S. Alam, and D. J. Richardson,

OFC 2013, paper OTu3G.2.

The Impact of Fiber Core Ellipticity and Modal Coherency on Few Moded Erbium Doped Fiber Amplifiers

E. L. Lim, S. Dasgupta, Q. Y. Kang, J. O. Daniel, F. Poletti, S. Alam, and D. J. Richardson

ECOC 2013, Paper P.1.15

Thulium doped fiber amplifiers for 2 micron telecommunications

S.U. Alam, Z.Li, J. M. O. Daniel, Y. Jung, A. M. Heidt and D. J. Richardson

CLEO-Pacific Rim/OECC 2013 Kyoto Japan 30 June-4 July 2014, (Invited) paper WS1-3

Diode-pumped wideband thulium-doped fiber amplifiers for optical communications in the 1800 – 2050 nm window

Z. Li, A. M. Heidt, N. Simakov, Y. Jung, J. M. O. Daniel, S. U. Alam, and D. J. Richardson

Optics express, 21 (22), 26450-26455, 2013

All-fiber, Ultra-wide Band Tunable Laser Source at 2 μm

Z. Li, S. U. Alam, Y. Jung, A. M. Heidt, and D. J. Richardson

Optics letters, (Online OSA early posting, Issue number not assigned yet)

100 kW peak power picosecond thulium-doped fiber amplifier system seeded by a gain-switched diode laser at 2 μm



A. M. Heidt, Z. Li, J. Sahu, P. C. Shardlow, M. Becker, M. Rothhardt, M. Ibsen, R. Phelan, B. Kelly, S. U. Alam, and D. J. Richardson

Opt. Lett. 38, 1615-1617 (2013)

Multi-mode and Multi-core EDFAs for Spatial-Division Multiplexing

D.J. Richardson

OFC 2013 Anaheim, 17-21 March 2013, OTu3G.1

Experimental Investigation of Inter-Modal Cross-Gain Modulation and Transient Effects in a Two Mode Group Erbium Doped Fiber Amplifier

Y. Jung, S. Alam, Z. Li, P. S. Teh, A. Dhar, J. K. Sahu, F. Poletti, R. J. Winfield, A. D. Ellis, and D. J. Richardson

ECOC 2012, paper Tu3F5.

We report what we believe to be the first experimentally study of inter-modal cross-gain modulation and associated transient effects as different spatial modes and wavelength channels are added and dropped within a two-mode amplifier for SDM transmission.

Modal Gain Control in a Multimode Erbium Doped Fiber Amplifier Incorporating Ring Doping

Qiongyue Kang, Eeleong Lim, Yongmin Jung, Jayanta Sahu, Francesco Poletti, Shaif-ul Alam, David

ECOC 2012, paper P1.05

We theoretically demonstrate the performance of a step index multimode (two mode-group) erbium-doped fiber amplifier with a localized erbium doped ring distribution for Space Division Multiplexed (SDM) transmission.

Modal Gain Equalization in a Few Moded Erbium-Doped Fiber Amplifier

S.-U. Alam, Y. Jung, Z. Li, A. Dhar, J. K. Sahu, F. Poletti and D. J. Richardson

SUM 2012 IEEE Photonics Society Summer Topical Meeting on Space Division Multiplexing for Optical Systems and Networks, paper WC2.1 (Invited)

We present results on broadband gain equalisation in a MM-EDFA for SDM transmission obtained by optimization of the pump launch and careful tailoring of both the fiber refractive index profile and erbium ion distribution.



<http://dx.doi.org/10.1109/PHOSST.2012.6280805>

Accurate modal gain control in a multimode erbium doped fiber amplifier incorporating ring doping and a simple LP01 pump configuration

Qiongyue Kang, Ee-Leong Lim, Yongmin Jung, Jayanta K. Sahu, Francesco Poletti, Catherine Baskiotis, Shaif-ul Alam, and David J. Richardson

Optics Express, Vol. 20, Issue 19, pp. 20835-20843 (2012)

We experimentally validate a numerical model to study multimode erbium-doped fiber amplifiers (MM-EDFAs). Using this model, we demonstrate the improved performance achievable in a step index MM-EDFA incorporating a localized erbium doped ring and its potential for Space Division Multiplexed (SDM) transmission. Using a pure LP01 pump beam, which greatly simplifies amplifier construction, accurate modal gain control can be achieved by carefully tuning the thickness of the ring-doped layer in the active fiber and the pump power. In particular, by optimizing the erbium-ring-doped structure and the length of active fiber used, over 20dB gain for both LP01 and LP11 signals with a maximum gain difference of around 2 dB across the C band are predicted for a pure LP01 pump beam delivering 250mW power at 980nm.

<http://dx.doi.org/10.1364/OE.20.020835>

Detailed study of modal gain in a multimode EDFA supporting LP01 and LP11 mode group amplification

Y.Jung, S.-U.Alam, Z.Li, A.Dhar, D.Giles, I.Giles, J.K.Sahu, F.Poletti, D.J.Richardson,

OFC 2012, paper OM3C.4

We demonstrate simultaneous modal gains of ~20dB for different pair-wise combinations of spatial and polarization modes in a MM-EDFA. The differential modal gains are reduced by fiber design and control of the pump field distribution.

<http://www.opticsinfobase.org/abstract.cfm?URI=OFC-2012-OM3C.4>