

Progress in Active Fibers for High-power and High-brightness Laser Applications

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Talk abstract: The development of low loss rare-earth doped silica fibers in mid-1980s, has revolutionized the optical communications through the discovery of erbium-doped fiber amplifiers (EDFAs). Since the successful implementation of EDFAs in communications, high-power fiber lasers and amplifiers have become a major field of operation for rare-earth doped fibers and, over the last decade, the use of fiber lasers has increased dramatically in the non-telecommunications area. Recent demonstrations of ytterbium-doped continuous-wave fiber laser with single-mode output powers in the multi-kilowatt regime and with very high overall efficiency shows the power scaling potential of fiber technology. Fiber lasers are now being used for industrial applications, such as welding, drilling and cutting. The continuous rise in the applications of high power fiber based sources has provided a platform for different types of fiber lasers to be developed, each with unique fiber properties to match that specific laser development. This talk will review the progress in high power fiber lasers and amplifiers, highlighting the advances in active fibers, seen to date, and those that will be required in the future.

Speaker biography: Dr. Jayanta K. Sahu is a Principal Research Fellow at the ORC, University of Southampton, UK. He received both his Master degree (M.Sc.) in Physics and Ph.D. from the India Institute of Technology, India. He has extensive experience in optical fibre technology. In 2000, he joined the ORC, and his current research interests include optical materials, optical fibre design, development of novel silica based fibre structures, and cladding-pumped rare-earth doped fibre lasers and amplifiers. In the course of his research career, he has published over 200 articles in scientific journals and conferences including several invited talks. Dr. Sahu presently leads the silica fibre fabrication group at ORC, and responsible for the development of most of the specialty optical fibres used in the research of fibre lasers and amplifiers at the ORC. In 2005, he received an UK Research Councils Robert's Fellowship (Academic fellowship). Dr. Sahu is also a consultant to SPI Lasers.