Muhammad Maqbool, J Material Sci Eng 2016, 5:9(Suppl)
http://dx.doi.org/10.4172/2169-0022.C1.052

Titanium doped semiconductor microring laser on optical fibers

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Microlaser plays an important role in laser technology and applications due to its smaller size. When a lasing material is deposited around an optical fiber, the cylindrical shape of the fiber acts as cavity for laser production. Transition metals and rare-earth elements are good candidates to produce such kind of laser due to their characteristic light emission in all UV, visible and IR regions of the spectrum. In this talk, an infrared laser made out of titanium doped aluminum nitride (AlN:Ti) deposited around an optical fiber will be discussed. Optical fibers of 12 μm diameter were coated with a sputter-deposited layer (4 μm thick) of titanium (1 at. %)-doped amorphous aluminum nitride. When optically pumped by an Nd:YAG green laser at 532 nm, laser action was observed in whispering gallery modes around the fiber (in a ring shape) at 780.5 nm with a quality factor Q>1500. Other modes were also observed between 775 and 800 nm. The primary and secondary modes give a mode separation of 4.6 nm. No waveguide modes were observed in the cavity.

Biography

Muhammad Maqbool works as an Associate Professor of Physics at Ball State University. He has obtained his PhD degree in Experimental Condensed Matter Physics from Ohio University, USA, in 2005. He has obtained his Master of Science degree in Medical & Radiation Physics from the University of Birmingham, UK, in 1998. His area of research is experimental condensed matter and surface physics. He has published over 60 research papers and book chapters in peer reviewed journals. He has presented his work in several international meetings, conferences and workshops. He has also worked as an organizing chair of the American Physical Society Ohio Region Fall-2011 meeting. He has obtained over half a million dollars in grant from various organizations like National Science Foundation, Indiana Academy of Science and Ball State University.

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