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High-power, high-brightness, tunable two color VECSELS

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High power, tunable two color semiconductor lasers are highly suitable for the new wavelengths generation thanks to various nonlinear conversions. Vertical external cavity surface emitting lasers (VECSELS) are of special interest due to the access to the high intracavity circulating power and wavelength control. In this talk, we will present our recently developed and patented T-cavity VECSEL capable of delivering high power, tunable two color emission will be presented. The T-cavity two-chip VECSEL allows emission of orthogonally polarized high-power collinear outputs of the two wavelengths. By composition and thickness engineering of strain-compensated multi-quantum well InGaAs active layers, a wide range of wavelengths is achieved. Intracavity birefringent filters are then used to facilitate tunability and wavelength separation between two colors. The tunability of the individual VECSEL chips in the collinear two-color T-cavity configuration enables the control of the spectral separation of the lasing peaks. A folded-cavity configuration of such laser is used for high power intracavity second harmonic and sum frequency generation of multi-watt blue and green emissions. Latest results will be reported.

Biography

Mahmoud Fallahi is a professor in the college of optical Sciences at the University of Arizona. He received his Ph.D. degree from the University of Toulouse and LAAS-CNRS, in 1988. He joined the National Research Council of Canada in 1989 and became a member of technical staff as a Research Scientist during 1992-1995. He joined the University of Arizona as an Assistant professor in 1995. His research has been extensively published in peer-reviewed scientific journals, reported in invited talks and published in international conference proceedings. He has authored or co-authored several book chapters, patents and invention disclosures. He has served as Conference Chair and Program Committee member in several international conferences in the field of semiconductor lasers and integrated optics. Since August 2014 he has been with the National Science Foundation (NSF) as a Program Director of the photonics program in the ECCS Division of Engineering Directorate. As a Program Director he is promoting and managing translational research in the field of optics and photonics.

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