

Propagation of partial coherent beam from unstable resonator with variable reflecting mirror through turbulent atmosphere

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Unstable resonators are one of the important candidates for lasers in long range applications. This is due to the good quality of the beam from unstable resonators. However one of the drawbacks of unstable resonators is the unwanted ripples on the spatial beam profile due to the diffraction of beam from the edge of the hard edge output coupler. One of the solutions to this problem is using variable reflecting mirror (VRM). Unstable resonator with VRM also could be implemented in lasers with low gain media such as chemical oxygen iodine laser (COIL) or thin disk lasers. On the other hand many researchers have shown that degree of coherence of the beam has important effects on propagated beam characteristics. Recently, we have investigated the propagation of partial coherent beam from ordinary unstable resonator through turbulent atmosphere. We have also investigated the propagation of fully coherent beam from VRM unstable resonator in another work. In the present paper, propagation of partial coherent beam from unstable resonator through turbulent atmosphere is assessed and the results are compared with those in two previous cases i.e. partially coherent beam from ordinary unstable resonator, and fully coherent beam from VRM unstable resonator. The results of this paper can be useful in studying any long range application of laser beam including propagation through turbulent atmosphere.

Biography

Mahdi Shayganmanesh was born in Tehran in 1975. He received the Ph.D. degree in atomic and molecular physics from Iran University of Science and Technology (IUST), Tehran, in 2009. He has been a Staff Member with the Iranian National Center for Laser Science and Technology (INLC), Tehran, for three years. He is currently with the Department of Physics, IUST as Assistant Professor. His current research interests includes optical resonators and beam quality.

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