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**Two-dimensional discrete-time laser model with bifurcations and Chaos****Abdul Qadeer Khan***University of Azad Jammu and Kashmir, Pakistan*

We explore the local dynamics, bifurcations and chaos in a two-dimensional discrete-time laser model. It is shown that for all involve parameters, model has boundary fixed point and the unique positive fixed point under definite parametric condition(s). Further local dynamics along with different topological classifications about fixed points have explored by linear stability theory. We also investigated the existence of prime-period and periodic points of the discrete-time laser model. It is investigated that flip bifurcation occurs about boundary fixed point, and also there exist a flip bifurcation if parameters vary in a small neighborhood of the unique positive fixed point. Further it is also explored that about unique positive fixed point, laser model undergoes a Neimark-Sacker bifurcation, and in the meantime stable invariant curve appears. Numerical simulations are implemented to validate not only obtain results but also exhibits complex dynamics of period-2,3,4,5,8 and 9. Further, Maximum Lyapunov exponents along with fractal dimension are computed numerically to validate chaotic behaviors of the laser model. Lastly, feedback control method is utilized to stabilize chaos present in the model.

**Biography**

Dr. ABDUL QADEER KHAN got the Ph.D. degree at the age of 32 years from Department of Mathematics, University of Azad Jammu and Kashmir, Muzaffarabad, Pakistan. During his PhD studies, he worked in the School of Mathematical Sciences, Shanghai Jiao Tong University, Shanghai, P. R. China under HEC "INTERNATIONAL RESEARCH SUPPORT INITIATIVE PROGRAMME (IRSIP)". Currently he is working as an Assistant Professor in the Department of Mathematics, University of Azad Jammu and Kashmir, Muzaffarabad, Pakistan. His current research interests include stability, bifurcations and control in some discrete-time mathematical models from physics, chemistry, biology, ecology etc. With in domain of research, Dr. Khan has published 82 research papers in well known reputed Journals, and moreover so for Dr. Khan has win 3 research projects from international funding agency. Dr. Khan has pupervised 25 MS students and 2 PhD students. Currently 8 Ms Students and 3 PhD students are under his supervision.