A numerical exploration of the dynamical behaviour of q-deformed nonlinear maps
Vinod Patidar, G. Purohit and K K Sud
Department of Basic Sciences, School of Engineering, Sir Padampat Singhania University,
Bhatewar, Udaipur, INDIA
vinod_r_patidar@yahoo.co.in

In this paper we explore the dynamical behaviour of the qdeformed versions of widely studied
1D nonlinear map-the Gaussian map and another famous 2D nonlinear map-the Henon map. The Gaussian map is perhaps the only 1D nonlinear map which exhibits the co-existing attractors. In this study we particularly, compare the dynamical behaviour of the Gaussian map and q-deformed Gaussian map with a special attention on the regions of the parameter space, where these maps exhibit co-existing attractors. We also generalize the q-deformation scheme of 1D nonlinear map to the 2D case and apply it to the widely studied 2D quadratic map-the Henon map which is the simplest nonlinear model exhibiting strange attractor.

Keywords: q-deformation, Gaussian map, Henon map, Lyapunov exponent, Chaos, co-existing attractors