Period-3 Point of Generalized Tent Mapping: Orbit Type and Stability Analysis

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Li-Yorke theorem shows for a continuous self-mapping in interval, if it has a period-3 point, it will have period-n point with any positive integer n. Therefore, period-3 point is worth exploring. This article studies a generalized tent mapping by using the continuity of mapping, cobweb plot and other methods. Vertex of this mapping is (a,b), left endpoint is (0,s) and right point is (1,c), while 0<a<1,0<b=1,0=c<1,0=s<1. For such one-dimensional nonlinear mapping, this article shows the number of period-3 points and period-3 orbits when parameter space is four-dimensional. Besides, this article provides orbit type and stability analysis of period-3 orbit and predict the final direction of points on[0,1] under n iterations.

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