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Non-autonomous Periodic Systems with Allee Effect

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Abstract: A new class of maps called unimodal Allee maps are introduced. Such maps arise in the study of population dynamics in which the population goes extinct if its size falls below a threshold value. A unimodal Allee map is thus a unimodal map with three fixed points, a zero fixed point, a small positive fixed point, called threshold point, and a bigger positive fixed point, called the carrying capacity. In this paper the properties and stability of the three fixed points are studied in the setting of non-autonomous periodic dynamical systems or difference equations. Finally we investigate the bifurcation of periodic systems/difference equations when the system consists of two unimodal Allee maps.

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