

1106-92-568

**Horst R Thieme\*** ([hthieme@asu.edu](mailto:hthieme@asu.edu)), School of Mathematical and Statistical, Sciences, Arizona State University, Tempe, AZ 85287-1804, and **Wen Jin**. *Towards a persistence theory for sexually reproducing structured populations*. Preliminary report.

Persistence of a structured population typically involves a threshold parameter  $R_0$  called the basic reproduction number which separates persistence from extinction.

If the population dynamics are modeled by iterating a map (discrete-time semiflow) and sexual structure or other types of mating are ignored,  $R_0$  typically is the spectral radius of a bounded linear map on a normed vector space that is a first order approximation of the original map at the extinction state. If mating is taken into account, the first order approximation is no longer additive but still a (positively) homogeneous (of degree one) map on the cone of an ordered normed vector space.

For homogeneous map there is an analogy to the spectral radius, called cone spectral radius. The question arises whether the cone spectral radius has similar threshold properties as the usual spectral radius. This is related to the question whether the cone spectral radius is an eigenvalue associated with positive eigenvectors and eigenfunctionals.

Applications are presented for spatially distributed or rank-structured populations that reproduce sexually. (Received September 02, 2014)