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A C Freitas, J M Freitas and **Mike Todd*** (mtodd@math.bu.edu), Dept of Math and Stats,
111 Cummington St, Boston, MA 02215. *Extremal index in dynamical systems.*

The notion of extremal index in Extreme Value Theory is a parameter $\theta \in [0, 1]$ determining the degree of clustering of extremes of some time series data. If the data is independently identically distributed then there is no clustering and the extremal index is 1. In the context of dynamical systems, Extreme Value Theory can be understood in terms of recurrence, where, fixing a point z in phase space and then taking some typical point x , an extreme event corresponds to an iterate of x landing very close to z . We show that for general systems, having an extremal index $\theta \in (0, 1)$ means that z is a repelling periodic point. Motivated by this problem in the dynamical systems context, we have developed easily checkable conditions which are applicable in both this and in the classical Extreme Value Theory context. Moreover, we show that clustering is generally produced by periodic behavior. (Received September 06, 2010)