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**Mark Holland, Matthew Nicol** and **Andrew Török\*** ([torok@math.uh.edu](mailto:torok@math.uh.edu)), Department of Mathematics, University of Houston, Houston, TX 77204-3008. *Extreme value distributions for non-uniformly hyperbolic dynamical systems*. Preliminary report.

Let  $f_t : X \rightarrow X$  be a non-uniformly hyperbolic map (discrete time) or suspension flow (continuous time) which may be modeled by a Young tower. Suppose that  $\varphi : X \rightarrow \mathbb{R}$  is a sufficiently regular function of the distance to a point  $x_0 \in X$  and has a maximum, finite or infinite, at  $x_0$ .

Define

$$Z_t(x) := \max_{0 \leq s \leq t} \varphi(f_s x).$$

We show that for typical  $x_0$ , the possible nondegenerate limit distributions of  $Z_t$  under linear scalings are the type I, II and III distributions of extreme value statistics that appear for IID's. We also determine which particular distribution arises as a function of  $\varphi$  and the underlying dynamics.

These improve results of P. Collet from 2001. (Received August 07, 2007)