1094-37-352 **Nicolai Haydn** (nhaydn@math.usc.edu), **Matthew Nicol** (nicol@math.uh.edu), **Sandro Vaienti** (vaienti@cpt.univ-mrs.fr) and **Licheng Zhang*** (zhanglic@math.uh.edu), Department of Mathematics, University of Houston, 4800 Calhoun Rd, Houston, TX 77004.

Central limit theorems for the shrinking target problem.

We establish central limit theorems for the shrinking target problem for generic points in a variety of hyperbolic dynamical systems. More precisely suppose $B_i := B(p, r_i)$ are nested balls of radius r_i about a point p in a dynamical system (T, X, μ). In many dynamical settings it has been shown that if $E_n := \sum_{i=1}^{n} \mu(B_i)$ diverges then $\lim_{n\to\infty} \frac{1}{E_n} \sum_{j=1}^{n} 1_{B_i}(T^i x) \to 1$ for μ a.e. $x \in X$. This is a self-norming type of strong law of large numbers called the Strong Borel-Cantelli property. We establish self-norming central limit theorems (CLT) of the form $\lim_{n\to\infty} \frac{1}{a_n} \sum_{i=1}^{n} [1_{B_i}(T^i x) - \mu(B_i)] \to N(0, 1)$ (in distribution) for generic points $p \in X$ for certain hyperbolic dynamical systems, where the normalization constants are $a_n^2 \sim E[\sum_{i=1}^{n} 1_{B_i}(T^i x) - \mu(B_i)]^2$. (Received August 27, 2013)