

1065-37-248

**De-Jun Feng**, Department of Mathematics, The Chinese University of Hong Kong, Shatin, Hong Kong, and **Huyi Hu\*** ([hu@math.msu.edu](mailto:hu@math.msu.edu)), Department of Mathematics, Michigan State University, East Lansing, MI 48824. *Local dimensions for iterated function systems.*

We study iterated function systems  $\{S : X \rightarrow X : i = 1, \dots, \ell\}$  on a closed subset  $X \subset \mathbb{R}^n$ . A probability measure  $\mu$  is said to be *exact dimensional* if there is a constant  $C$  such that the *local dimension*  $d(\mu, x) = \lim_{r \rightarrow 0} \frac{\log \mu(B(x, r))}{\log r}$  exists and equals  $C$  for  $\mu$ -a.e.  $x \in \mathbb{R}^d$ , where  $B(x, r)$  denotes the closed ball of radius  $r$  centered at  $x$ . It is well known that if a system is conformal and satisfies some separation condition, then any invariant measure is exact dimensional. We show that the results also hold for conformal systems with overlaps, and for affine systems of the form  $S_i = A_i x + a_i$  with  $A_i A_j = A_j A_i$ . (Received September 14, 2010)