1018-28-81 **Yang Wang***, School of Mathematics, Georgia Tech, Atlanta, GA 30332. *Self-Affine Tiles and Basic Digit Sets.* Preliminary report.

Let A be an $d \times d$ matrix with integer entries and $q = |\det(A)|$. A subset $D = \{0, d_1, \ldots, d_{q-1}\}$ of $\mathbb{Z}^d$ is called a basic digit set if all elements in $\mathbb{Z}^d$ can be represented as a sum of the form $\sum_{k=0}^{N} a_k A^k$ where each $a_k \in D$. This problem is directly linked to the study of self-affine tiles. In this talk, I'll discuss some basic results and list several unsolved problems. (Received February 27, 2006)