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**Zoe Koch\*** (kochzoe@gmail.com), 0942 Heritage Center, Salt Lake City, UT 84112. *Increasing Representations in Additive Bases*. Preliminary report.

A set  $A \subseteq [n] \cup \{0\}$  is said to be a 2-additive basis for  $[n]$  if each  $j \in [n]$  can be written as  $j = x + y$ ,  $x, y \subseteq A$ ,  $x \leq y$ . If we pick each integer in  $[n] \cup \{0\}$  independently with probability  $p = p_n \rightarrow 0$ , thus getting a random set  $A$ , we can analyze the probability of obtaining a 2-additive basis. We can also manipulate  $r_k(n)$ , the number of ways of representing each integer  $n$  as the sum of  $k$  elements from  $A$ . We focus  $r_k(n)$  values to  $2 \leq r_k(n) \leq C \log n$  and truncate our area of interest to a target sum-set  $[\alpha n, (2 - \alpha)n]$  for some  $0 < \alpha < 1$ . We then use probability methods to look for a threshold for the emergence of a 2-additive basis with multiple representations of a specified amount. (Received September 08, 2013)