1096-VH-211 **Taylor C Corcoran***, taylorc3@email.arizona.edu, and **Jirapat Samranvedhya**. *Benford Behavior of Dependent Random Variables.* Preliminary report.

Many mathematical, man-made, and natural systems exhibit a leading-digit bias, where a first digit (base 10) of 1 occurs not 11% of the time as one would expect if all digits were equally likely but rather 30%. This digit bias is known as Benford's Law and arises in diverse fields, ranging from computer science to forensic accounting. Benford's Law is vital to the analysis of large datasets and is an important means of detecting data tampering and fraud. Analyzing which datasets adhere to Benford's Law and how quickly Benford behavior sets in are the two most important problems in the field.

Inspired by natural processes such as particle decay, we study the dependent random variables that emerge from models of decomposition of conserved quantities. We prove that in many instances the distribution of lengths of the resulting pieces converges to Benford behavior as the number of divisions grow. The main difficulty is that the resulting random variables are dependent, which we handle by a careful analysis of the dependencies and tools from Fourier analysis to obtain quantified convergence rates. We also apply these techniques to the determinant expansion of $n \times n$ matrices with entries drawn from 'nice' distributions. (Received August 19, 2013)