

**Meeting:** 1001, Evanston, Illinois, SS 8A, Special Session on Computability Theory and Applications

1001-03-183      **Joseph S. Miller\*** ([millerj7@indiana.edu](mailto:millerj7@indiana.edu)), Department of Mathematics, Indiana University, Rawles Hall, Bloomington, IN 47405, and **Liang Yu** ([Yu.Liang@mcs.vuw.ac.nz](mailto:Yu.Liang@mcs.vuw.ac.nz)), School of Mathematical and Computing Sciences, Victoria University, P.O. Box 600, Wellington, New Zealand. *The initial segment complexity of random reals.*

We study the prefix-free Kolmogorov complexity of initial segments of random reals. We show that  $\sum_{n \in \omega} 2^{-f(n)}$  converges iff there is a 1-random real  $X$  such that  $K(X \upharpoonright n)$  is dominated by  $n + f(n)$ . We also characterize the functions  $g$  such that  $K(X \upharpoonright n)$  dominates  $n + g(n)$  for almost every  $X$ . To prove these results we re-examine the basic combinatorics of prefix-free complexity, improving well-known results of Chaitin. (Received August 24, 2004)