Hung Lu* (luhungtim@yahoo.com), Department of Mathematics, 1164 Bishop Street, MP 260, Honolulu, CA 96813, and Michel L. Lapidus (sykomath@yahoo.com), LA PALMA, CA 90623. 

Nonarchimedean Cantor Set and String.

We construct a nonarchimedean (or $p$-adic) analogue of the classical ternary Cantor set $C$. In particular, we show that this nonarchimedean Cantor set $C_3$ is self-similar. Furthermore, we characterize $C_3$ as the subset of 3-adic integers whose elements contain only 0’s and 2’s in their 3-adic expansions and prove that $C_3$ is naturally homeomorphic to $C$. Finally, from the point of view of the theory of fractal strings and their complex fractal dimensions [7, 8], the corresponding nonarchimedean Cantor string resembles the standard real (or archimedean) Cantor string perfectly.

(Received July 11, 2007)