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Hung Lu* (hlu@hpu.edu), 1188 Fort Street Mall, Suite 430, Honolulu, HI 96813, and **Michel L. Lapidus**. *p-adic fractal strings and their complex dimensions*.

We develop a geometric theory of p -adic fractal strings and their complex dimensions. We obtain an explicit volume formula for the tubular neighborhood of a p -adic fractal string \mathcal{L}_p , expressed in terms of the underlying complex dimensions. We also prove that the abscissa of convergence of the geometric zeta function associated to a self-similar string \mathcal{S}_p coincides with the Minkowski dimension of \mathcal{S}_p . The general theory is illustrated by some simple examples, the nonarchimedean Cantor, Euler, and Fibonacci strings. (Received September 13, 2009)