1058-46-56 **Hafedh Herichi*** (herichi@math.ucr.edu), Mathematics department, Surge 283., University of California, Riverside, 900 University Ave., Riverside, CA 92521. *On the spectral operator for generalized fractal strings.*

A generalized fractal string, η; viewed as a discrete or continuous measure, is the associated measure to an ordinary fractal string. The spectral operator was introduced by M. L. Lapidus and M. van Frankenhuisjen in their theory of complex dimensions in fractal geometry. It is defined as the operator mapping the counting function of a generalized fractal string η to the counting function of its associated spectral measure $\nu = \eta * h$, where $*$ is the operation convolution of measures and h is the generalized harmonic string,

$$a(f)(t) = \zeta(\partial)(f)(t) = \prod_{p \in \mathbf{P}} (1 - (\partial)^{-1})^{-1}(f)(t)\,,$$

where f is the counting function of the generalized fractal string and $\mathbf{P}$ is the set of prime numbers. It relates the spectrum of a fractal string with its geometry. The spectral operator has also an Euler product representation, which provides a counterpart to the usual Euler product expansion for the Riemann Zeta function, but convergent in the critical strip of the complex plane. During this talk we will be discussing, in details, some fundamental properties of this operator as well as its prime-factors. (Received February 12, 2010)