COMPLEX DIMENSIONS OF ORBITS OF PARABOLIC GERMS

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The standard zeta function can be generalized to a zeta function of the so-called fractal string. Various (almost equivalent) definitions of zeta functions of a general bounded set that generalize this definition have been introduced by Lapidus, one of them being the Mellin transform of the epsilon-neighborhood of the set. The singularities of such integral transform are called the complex dimensions of the set. We prove the existence of the meromorphic extensions of fractal zeta functions of orbits of dynamical systems generated by parabolic germs of analytic diffeomorphisms on the real line and describe their complex dimensions. We then relate complex dimensions to some intrinsic properties of the generating function and to the geometry of its orbits.

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