

Dynamical zeta functions, Fried's conjecture and refined analytic torsion

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Abstract: The dynamical zeta functions of Ruelle and Selberg are functions of a complex variable s and are associated with the geodesic flow on the unit sphere bundle of a compact hyperbolic manifold. Their representation by Euler-type products traces back to the Riemann zeta function. In this talk, we will present trace formulae and the machinery that they provide to study the analytic properties of the dynamical zeta functions and their relation to the analytic torsion, a spectral invariant. One can refer to this relation as the so called Fried's conjecture. In the case of a non-unitary twist, i.e., a non-unitary representation of the fundamental group of the manifold, one has to consider a refinement of the analytic torsion as it is introduced by Braverman and Kappele. In addition, time depending, we will present a comparison of the refined analytic torsion and the Cappell-Miller torsion.