

Topology of Pollicott-Ruelle resonant states

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Abstract. We prove that the twisted De Rham cohomology of a flat vector bundle over some smooth manifold is isomorphic to the cohomology of invariant Pollicott–Ruelle resonant states associated with Anosov and Morse–Smale flows. As a consequence, we obtain generalized Morse inequalities for such flows. In the case of Morse–Smale flows, we obtain a trace formula for the Pollicott–Ruelle resonances lying on the imaginary axis which involves the twisted Fuller measures used by Fried in his work on Reidemeister torsion. In particular, when V is a nonsingular Morse–Smale flow, we show that the Reidemeister torsion can be recovered from the resonances lying on the imaginary axis.

Mathematics Subject Classification (2010): 37D15 (primary); 37D20, 58A10, 58A12, 58A14 (secondary).