

Abstract

In this talk we will introduce a Joint work with K. Fedosova and J. Rowlett .Let X be a compact Riemann surface of genus $g \geq 2$. The Selberg zeta function $Z(s)$ for X is an infinite product over the prime geodesics of elementary factors involving the lengths of the geodesics. It is related to the trace of the resolvent of Laplace – Beltrami operator Δ (more precisely the difference of the resolvents) via the Selberg trace formula, and also the determinant $\det\Delta$ namely the analytic torsion. We study the second variation formula for $Z(s)$ as a function on the Teichmuller space. We prove certain positivity for $s=m$ being a sufficiently large integer.