Geometric invariants of spectrum of the Navier-Lame operator

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In this talk, we review the asymptotic expansions of the heat traces for various operators including the Laplace operator, the poly-Laplace operator, the Maxwell operator, the Stokes operator, etc. Then for the elastic Navier-Lame operator (a non-Laplace type operator) on a compact connected Riemannian n-manifold M with smooth boundary, we explicitly obtain the first two coefficients of the asymptotic expansion of the heat trace for Navier-Lame operator with Dirichlet and Neumann boundary conditions. These two coefficients provide precise information for the volume of the elastic body M and the surface area of the boundary in terms of the spectrum of the Navier-Lame operator. This gives an answer to an interesting and open problem mentioned by Avramidi.