

Research on Eigenvalue Estimates and Related Stability Problems on Compact Manifolds with Boundary

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Abstract:

Lower bound of Steklov eigenvalues and Escobar's conjecture are crucial issues in geometric analysis. Let (Ω, g) be a compact manifold with boundary Σ. Escobar conjectured that if $Ric_\Omega \geq 0$, $h \geq g|_\Sigma$, then the first nonzero Steklov eigenvalue $\sigma_1 \geq 1$. Currently, counterexamples have been found showing that this conjecture is false. Accordingly, we plan to investigate the optimal lower bound for σ_1, as well as other issues related to Steklov eigenvalues.

Stability problems also constitute a very important class of problems, which have received extensive attention in many fields such as geometric analysis and PDEs. We intend to investigate stability problems related to Steklov eigenvalues and eigenvalues of the boundary Laplacian on compact manifolds with convex boundary.