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Selberg's Zeta Function and Its Children

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Abstract. Ideas of quantum-mechanical scattering theory have been applied with remarkable success to study the spectrum of the Laplacian on complete, non-compact Riemannian manifolds with "simple geometry at infinity" and clarify its connection with classical mechanics, that is, geodesic flow. This talk reviews recent developments in scattering theory for Riemannian manifolds with constant curvature at infinity, including exact trace formulas, connections with Selberg's zeta function for geodesic flow, and the inverse resonance problem.