Discrete spectrum of the Laplacian on non-Riemannian locally symmetric spaces

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Abstract: The spectrum of the Laplacian has been extensively studied on Riemannian manifolds, and particularly Riemannian locally symmetric spaces. Toshiyuki Kobayashi and I have considered similar problems for non-Riemannian locally symmetric spaces. I will explain our results in the case of anti-de Sitter 3-manifolds, i.e. Lorentzian 3-manifolds of constant negative curvature. In this case, spectral theory relies on a good understanding of the geometry of proper actions of discrete subgroups of $SL_2(\mathbb{R}) \times SL_2(\mathbb{R})$ on $SL_2(\mathbb{R})$ (by left and right multiplication), and there are interesting links with the representation theory of surface groups into $SL_2(\mathbb{R})$.