

## The Bottom of the $L^2$ Spectrum of Higher-rank Locally Symmetric Spaces

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For a rank one geometrically finite locally symmetric space  $\Gamma \backslash X$ , the bottom of the  $L^2$  spectrum of the Laplace operator is a simple eigenvalue corresponding to a positive eigenfunction if and only if the critical exponent of  $\Gamma$  is strictly greater than half the volume entropy of  $X$ . In particular, there exists infinite volume rank one locally symmetric spaces with square integrable positive Laplace eigenfunctions. In contrast, a higher-rank symmetric space  $\Gamma \backslash X$  without rank one factors has a square-integrable positive Laplace eigenfunction if and only if  $\Gamma$  is a lattice. We will explain some aspects of the connection between square integrability of positive Laplace eigenfunctions and Patterson-Sullivan and Bowen-Margulis-Sullivan measures in the higher-rank setting. Based on joint work with Oh and Fraczyk-Lee-Oh.

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