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**Adrienne I Sands\*** (sands265@umn.edu). *Automorphic Hamiltonians, Epstein zeta functions, and Kronecker limit formulas.*

We generalize the quantum harmonic oscillator from the real line to spaces of automorphic forms. More precisely, we construct a perturbed Laplacian which has purely discrete spectrum on  $L^2(SL_r(\mathbb{Z})\backslash SL_r(\mathbb{R})/SO(r, \mathbb{R}))$ , identify its ground state, and show how it can characterize a nuclear Fréchet automorphic Schwartz space. The construction of this so-called automorphic Hamiltonian connects certain degenerate Eisenstein series, Epstein's zeta functions, and Kronecker's first limit formula. We provide enough background to make this talk accessible to advanced undergraduates. (Received September 10, 2020)