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Renormalised vacuum polarisation on topological black holes

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Anti-de Sitter spacetime is a solution of Einstein's equations with a negative cosmological constant. This fact allows for unusual black hole solutions with non-spherical horizon topology. We calculate the renormalised vacuum polarisation for black holes with spherical, flat and hyperbolic event horizons, following the "extended coordinates" method, which uses a mode-sum representation for the Hadamard parametrix. Renormalisation counter terms are subtracted from the Green's function mode-by-mode, leaving each individual term manifestly finite.

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