INDEFINITE THETA FUNCTIONS AND BLACK HOLE PARTITION FUNCTIONS

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ABSTRACT. We explore various aspects of supersymmetric black hole partition functions in four-dimensional toroidally compactified heterotic string theory. These functions suffer from divergences owing to the hyperbolic nature of the charge lattice in this theory, which prevents them from having well-defined modular transformation properties. In order to rectify this, we regularize these functions by converting the divergent series into indefinite theta functions, thereby obtaining fully regulated single-centered black hole partitions functions. Based on work with Gabriel Cardoso, Michele Cirafici and Rogerio Jorge.