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Entropy of N-Dimensional Spherically Symmetric Charged Black Hole

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Abstract: By using the method of quantum statistics, we derive directly the partition functions of bosonic and fermionic fields in the N-dimensional spherically symmetric charged black hole space-time. The statistical entropy of black hole is obtained by an improved brick-wall method. When we choose proper parameters in our results, we can obtain that the entropy of black hole is proportional to the area of horizon. In our result, there do not exist neglected term and divergent logarithmic term given in the original brick-wall method. We avoid the difficulty in solving the wave equation of scalar and Dirac fields. We offer a simple and direct way of studying entropy of the higher-dimensional black hole.

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