Statistical Entropy of Horowitz-Strominger Black Hole

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Abstract: The partition functions of bosonic and fermionic fields in Horowitz-Strominger black hole are derived directly by quantum statistical method. Then via the improved brick-wall method (membrane model), the statistical entropy of black hole is obtained. If a proper parameter is chosen in our result, it is found out that the entropy is proportional to the area of horizon. The stripped term and the divergent logarithmic term in the original brick-wall method no longer exist. The difficulty in solving the wave equations of scalar and Dirac fields is avoided. A new neat way of calculating the entropy of various complicated black holes is offered.

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