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(2+1)-Dimensional AdS Black Hole in Grand Canonical Ensemble

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Abstract: We investigate thermodynamics of the (2+1)-dimensional AdS black hole in grand canonical ensemble. In the York's formalism, the black hole is enclosed in a "box" with a finite radius and the boundary temperature, radius and potential are fixed in the grand canonical ensemble. We investigate the thermodynamical properties such as action, entropy, temperature, etc. We only find the stable solution for (2+1)-dimensional AdS black hole and do not find the instanton with the negative heat capacity.

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