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Schwarzschild radius and black hole thermodynamics with alpha' corrections from simulations of SUSY matrix quantum mechanics

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We present new results from our Monte Carlo simulation of SUSY matrix quantum mechanics with 16 supercharges at finite temperature. The internal energy can be fitted nicely to the behavior predicted from the dual black hole thermodynamics including the alpha' corrections. The temporal Wilson loop can also be predicted from the gravity side, and it is directly related to the Schwarzschild radius of the dual black hole geometry. Our results for the Wilson loop indeed confirm this prediction up to subleading terms anticipated from the alpha' corrections on the gravity side. All these results give us strong support and a firm basis for the idea to use matrix model simulations to study quantum gravity.

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