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The String Worldsheet as one Candidate Dual Description of SYK Model (Yun-Long Zhang, APCTP, China)

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Recent studies of the fluctuations of an open string in AdS space show some pieces of evidence that the string with a worldsheet horizon could be a dual description of SYK model, as they saturate universal chaos bound and share the same symmetry. An open string hangs from the AdS boundary to the horizon of black brane could be dual to a 0+1 dimensional boundary state. To be specific, we find that the fluctuation of the string in charged BTZ black hole has an asymptotic scaling symmetry, and its Euclidean IR fixed point is governed by the quadratic order of Schwarzian action, which is just the low energy effective theory of the SYK model. Considering the open string worldsheet also has natural reparametrization symmetry, we conjecture that the action of the string worldsheet is an effective dual description of SYK model.

Summary