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Non-perturbative study of Yang-Mills theory with four supercharges in two dimensions

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We present an update of our results for the ongoing work on the four-supercharge two-dimensional Yang–Mills theory discretized on a Euclidean torus using thermal boundary conditions. Although the theory under consideration does not have a gravity dual, we investigate whether it has features qualitatively similar to its sixteen-supercharge counterpart. Our investigation hints at a possible ‘spatial deconfinement’ transition in this theory similar to the maximal one with sixteen supercharges. We also analyse the behaviour of the scalars, Wilson lines, and the absence of supersymmetry breaking with a relatively large- N setup and various lattice sizes in different coupling (temperature) regimes and draw comparisons with the two-dimensional maximally supersymmetric Yang–Mills theory.

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