

Abstract Submitted
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Confinement and Graded Partition Functions for $\mathcal{N} = 4$ SYM¹

ADITYA DHUMUNTARAO, ALEKSEY CHERMAN, University of Minnesota — Gauge theories with confining phases at low temperatures tend to deconfine at high temperatures. In some cases, for example in supersymmetric theories, confinement can persist for all temperatures provided the partition function includes a grading by $(-1)^F$. When it is possible to define partition functions which smoothly interpolate between no grading and $(-1)^F$ grading, it is natural to ask if there are other choices of grading that have the same effect as $(-1)^F$ on confinement. We explore how this works for $\mathcal{N} = 4$ SYM on $S^1 \times S^3$ in the large N limit at both small and large coupling. We find evidence for a continuous range of grading parameters that preserve confinement for all temperatures at large coupling, while at small coupling only a discrete set of gradings preserve confinement.

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