

At low energies or temperatures, maximally supersymmetric Yang-Mills theory on $\mathbb{R}^{(t)} \times S^1$ with large N gauge group $SU(N)$ and strong t'Hooft coupling is conjectured to be dual to the low energy dynamics of a collection of D0-branes on a circle. We construct thermal states in the gravitational side of the correspondence where we find a first-order phase transition between states that are uniform on the S^1 and states that are localised on it. When compared with lattice computations that are now available, these critical values provide the first instance where a first-order phase transition is tested on both sides of gauge/gravity duality.