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Towards holography for the IKKT matrix model

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A particularly interesting corner of holographic dualities is the correspondence between type II strings on Dp branes geometries and d = p+1 dimensional super Yang-Mills theories with sixteen supercharges. For the extremal case p=-1, this suggests a holographic duality for the IKKT matrix model. Despite intriguing and highly non-trivial results in the IKKT model, this duality has, until recently, received only limited attention. In this talk, I will consider the lowest supermultiplet of gauge invariant operators of the model and identify its states with the lowest Kaluza-Klein fluctuations of Euclidean IIB supergravity on the dual D(-1) instanton background. I will explain how to construct its holographic bulk realisation as a one-dimensional maximal supergravity with local SO(10) invariance, capturing the full non-linear dynamics. By analyzing the bulk Killing spinor equations, I will present various half-supersymmetric solutions that break SO(10), and discuss the corresponding brane interpretations. I will end with a few remarks on future directions.

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