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Penrose limit of MNa solution and spin chains in three-dimensional field theories

We consider the Penrose limit of the MNa solution, a theory with spontaneous breaking of $calN = 1$ supersymmetry in 3 dimensions, a case for which the holographic map is less understood. We compare the resulting pp wave and its string eigenstates to a sector of the theory on 5-branes reduced on S^3, and a spin chain-like system. We obtain many of the features of the pp wave analysis, but a complete matching still eludes us. We suggest possible explanations for the resulting partial mismatch, and compare against other spin chains for 3-dimensional field theories with gravity duals, like ABJM and GJV, as well as to the holographic cosmology case, in order to better understand the issues involved.

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