

Heterotic M2-Branes

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M-Theory has been conjectured as a single theory in which we can find each of the various superstring theories, and as such provides a UV completion of 11d supergravity. Instead of strings, we have M2-branes and M5-branes. The classic Horava-Witten result says that a compactification of M-theory on S^1/\mathbb{Z}_2 retrieves the $E_8 \times E_8$ heterotic theory, with the wrapped M2-brane as the “fundamental” string. In this work, we reproduce this result from the perspective of the ABJM theory, a world volume theory conjectured to capture the low-energy behaviour of multiple M2-branes. In particular, we find that the subtle nature of Chern-Simons matter theories delivers a new perspective on the GSO projection and the non-supersymmetric $SO(16) \times SO(16)$ heterotic theory.

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