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A Gravitino Distance Conjecture

Thursday 23 September 2021 12:25 (15 minutes)

We conjecture that in a consistent supergravity theory with non-vanishing gravitino mass, the limit $m_{3/2} \to 0$ is at infinite distance. In particular one can write m_{tower} $m_{3/2}$ so that as the gravitino mass goes to zero, a tower of KK states as well as emergent strings becomes tensionless. This conjecture may be motivated from the Weak Gravity Conjecture as applied to strings and membranes and implies in turn the AdS Distance Conjecture. Some evidence in type IIA vacua and F-theory settings will be presented. Moreover, we obtain general lower bounds $1/3, 1/4$ for Calabi–Yau threefolds and fourfolds, respectively. The conjecture has important phenomenological implications, both for particle physics and cosmology.
Based on 2104.10181 [Castellano, A., Font, A., Herráez, A. et al. A gravitino distance conjecture. J. High Energ. Phys. 2021, 92 (2021). https://doi.org/10.1007/JHEP08(2021)092].

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Summary

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