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The Gravitino and the Swampland

Monday, 17 May 2021 15:00 (1 hour)

We propose a new swampland conjecture stating that the limit of vanishing gravitino mass corresponds to the massless limit of an infinite tower of states and to the consequent breakdown of the effective field theory. We test our proposal in large classes of models coming from compactification of string theory to four dimensions, where we identify the Kaluza-Klein nature of the tower of states becoming light. We point out a general relation between the gravitino mass and abelian gauge coupling in models with extended supersymmetry, which can survive also in examples with minimal supersymmetry. This allows us to connect our conjecture to other well established swampland conjectures, such as the weak gravity conjecture or the absence of global symmetries in quantum gravity. We discuss phenomenological implications of our conjecture in (quasi-)de Sitter backgrounds and extract a lower bound for the gravitino mass in terms of the Hubble parameter.

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