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How Potent is Nilpotent Inflation?

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We study the embedding of inflation with nilpotent multiplets in supergravity, in particular the decoupling of the sgoldstino scalar field. Instead of being imposed by hand, the nilpotency constraint on the goldstino multiplet arises in the low energy-effective theory by integrating out heavy degrees of freedom. We find that the inflaton potential receives two types of corrections which are otherwise missed. One is from the backreaction of the sgoldstino, the other from the heavy fields generating its mass. Because these scale oppositely with the Volkov-Akulov cut-off scale, a consistent decoupling of the sgoldstino is questionable. Still, we identify a parameter window in which sgoldstino-less inflation can take place, up to corrections which flatten the inflaton potential.

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