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A closer look to the sgoldstino interpretation of the diphoton excess

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We revisit the sgoldstino interpretation of the diphoton excess in the context of gauge mediation: we show that the interpretation is viable in a thin, near critical region of the parameter space. This regime gives rise to drastic departures from the standard gauge mediation picture. While the fermion messengers lie in the 10-100 TeV range, some scalar messengers are significantly lighter and are responsible for the sgoldstino production and decay. Their effective coupling to the sgoldstino is correspondingly enhanced, and a non-perturbative regime is triggered when light and heavy messenger masses differ by a factor [~]4 pi.

Summary

We revisit the sgoldstino interpretation of the diphoton excess in the context of gauge mediation: we show that the interpretation is viable in a thin, near critical region of the

parameter space. This regime gives rise to drastic departures from the standard gauge mediation picture. While the fermion messengers lie in the 10-100 TeV range, some scalar messengers are significantly lighter and are responsible for the sgoldstino production and decay. Their

effective coupling to the sgoldstino is correspondingly enhanced, and a non-perturbative regime is triggered when light and heavy messenger masses differ by a factor ~4 pi.

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