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Prompt Signals and Displaced Vertices in Sparticle Searches

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We examine the phenomenology of a next-to-minimal gauge mediated supersymmetry breaking model which has attractive properties in the BEH sector: it can fit Higgs data with relative light (around 1 TeV or so) sparticle masses, resulting in less fine tuning. The model predicts displaced vertices. We demonstrate the the signal efficiency of a particular ATLAS displaced vertex analysis is poor for this model, but show how weakening the displaced cuts, but controlling backgrounds with cuts on concomitant prompt objects significantly increases the signal efficiency. We derive bounds from Run I and sensitivity for LHC Run II.

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