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Search for Long-Lived Gluinos in Compressed SUSY Scenarios

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This analysis is set in the context of the Supersymmetric Compressed Scenarios, characterized by a very high compression in the mass spectrum of the gauginos and higgsinos below the TeV scale, while the scalar superpartners are out of reach of the LHC experiment. We use CMS Run II data with a center-of-mass energy of $\sqrt{s} = 13$ TeV to perform a search on a promising channel characterized by the production of two gluinos, each one decaying into a quark, anti-quark and neutralino 1. The signal leads to a hard to detect signature, characterized by the presence of a moderate missing transverse energy (E_T^{miss}), secondary vertices and low energy jets. We thus require a hard jet from initial state radiation to 'tag' the event. We use a E_T^{miss} trigger to select the events, which allows us to typically select signal events that have at least one jet from the initial state radiation. In addition, we use information from jets and vertices (primary and secondary) reconstructed by the CMS to select events with sufficient information to identify the decay of at least one of the gluinos.

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