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Probing top-philic sgluons with LHC Run I data

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Many theories beyond the Standard Model predict the existence of colored scalar states, known as sgluons. Sgluons are expected to be copiously pair-produced at the LHC via strong interactions. In scenarios where they are top-philic, such as SUSY with Dirac gauginos, sgluons can be sought in multitop events at the LHC. We revisit two LHC Run I analyses that utilise events with either the same-sign dileptonic or single leptonic decay of a four-top-quark system. Employing both parameterisations of the detector response and a novel Matrix-Element method, reinterpretation of these two analyses are performed in the context of sgluon production. Adopting a simplified model approach, this reinterpretation allows us to extract bounds on the sgluon mass, and for the first time in the field, its couplings.

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