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## Search For Low-Mass Quark-Antiquark Resonances Produced With an Initial State Photon at 13 TeV Using the CMS Detector

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We present a search for low-mass narrow quark-antiquark resonances. This search uses data from the LHC in proton-proton collisions at a center-of-mass energy of 13 TeV, collected by the CMS detector in Run 2, and corresponds to an integrated luminosity of  $136 \text{ fb}^{-1}$ . The analysis strategy makes use of an initial state photon recoiling against the narrow resonance. The resulting large transverse momentum ( $p_T$ ) of the resonance leads to its decay products being collimated into a single jet with internal two-pronged substructure. The new physics signal is searched for as a narrowly peaking excess above the standard model backgrounds in the jet mass spectrum. During the 2018 data taking period, a lower photon  $p_T$  threshold trigger was implemented and is used in this analysis, allowing us to better probe the lower mass region. The variable  $N2DDT$  is used to identify two-pronged substructure jets, which is decorrelated with the jet's mass and  $p_T$ . An alternate method of selecting jets with two-pronged substructure using a machine learning algorithm called ParticleNet is also in development. A mostly data-driven method is used to determine the backgrounds in the analysis. A leptophobic  $Z'$  decaying to quarks is the benchmark model used, and the analysis is further motivated by a simplified model of dark matter involving a mediator particle interacting between quarks and dark matter.

### Mini Symposia (Invited Talks Only)

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