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Search for low-mass resonances decaying into two jets and produced in association with a photon using pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector

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Many models predict new particles with sizeable couplings to quarks and gluons. A search is performed for localized excesses in dijet mass distributions of low-dijet-mass events produced in association with a high transverse energy photon. The search uses up to 79.8 fb^{-1} of LHC proton-proton collisions collected by the ATLAS experiment at a center-of-mass energy of 13 TeV during 2015–2017. Two variants are presented: one that makes no jet flavour requirements and one that requires both jets to be tagged as b-jets. The observed mass distributions are consistent with multi-jet processes in the Standard Model. The data are used to set upper limits on the production cross-section for a benchmark Z' model and, separately, on generic Gaussian-shape contributions to the mass distributions, extending the current ATLAS constraints on dijet resonances to the mass range between 225 and 1100 GeV.

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