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A search for the decays of stopped long-lived particles with the ATLAS detector

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Long-lived particles are featured in many beyond-the-Standard Model theories. Produced in proton–proton (pp) collisions, they can come to rest within the ATLAS detector to decay some time later. The analyzed dataset is composed of pp–collisions delivered by the Large Hadron Collider at a centre-of-mass energy of $\sqrt{s}$=13 TeV and collected by the ATLAS experiment during 2017 and 2018. To detect the subsequent decays of these long-lived particles, the data used are collected during periods in the LHC bunch structure where collisions are absent. The results of this search are used to derive lower limits on the mass of gluino R-hadrons, with masses of up to 1.4 TeV excluded for gluino lifetimes of 10^{-5} to 10^{3} s.

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