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Search for Dark Matter from Baryon Number Violation Process in Proton-Proton Collisions at 13 TeV.

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The visible content of the Universe is made up of baryons and almost without of anti-baryons, so it requires a baryogenesis mechanism to generate the baryon asymmetry and it is widely believed that successful baryogenesis requires extending the Standard Model. There are strong evidence of invisible contents, Dark Matter (DM) in the universe in astrophysical observations, such as rotational curves of galaxies, gravitational lensing and bullet cluster. This analysis searches for the dark matter production in baryon number violation (BNV) process in proton-proton collision. The data sample, collected by the CMS experiment during the 2016-2018 data taking of the LHC, corresponds to an integrated luminosity of 137 fb-1 at a center-of-mass energy of 13 TeV. The events are required to contain missing transverse momentum and one jet with additional b-tagged jet arising from initial-state gluon splitting. The results are interpreted in the context of simple TeV-scale model of BNV in which a heavy colored scalar mediator is produced in down-type quarks interaction (b+s or b+d) and decays into DM and one up-type quark (u or c).

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Yes

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