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(G*) Measurements of the production cross section for the collinear emission of a Z boson from a jet in pp collisions at 13 TeV with the ATLAS detector

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Measurements of the production cross section of a Z boson decaying to muons and electrons in association with at least one energetic jet (Z+jet) are presented. Then, the Z+jets events are further separated into a topology corresponding to the collinear emission of an on-shell Z boson from a high-energetic jet, corresponding to the radiation of a Z boson from a quark such that their angular separation is small. The measurements are performed in proton–proton collisions at center-of-mass energy of 13 TeV, using data corresponding to an integrated luminosity of 139 inverse femtobarns collected by the ATLAS experiment at the CERN Large Hadron Collider. The fiducial cross sections are compared to state-of-the-art Monte-Carlo predictions, which allows for a detailed study of the mechanism of Z boson production at next-to-next leading order within the framework described by the Standard Model of particle physics.

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