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Search of heavy long-lived particles with large ionization energy loss at the CMS experiment

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I will present the current search in the CMS experiment for exotic signatures characteristic of massive particles with a sufficiently long lifetime to be considered stable at the detector scale, and electrically charged. Such particles, among other things, have a special properties: because of their large mass, they deposit more energy in the matter than Standard Model particles.
As a first step, I worked on the reconstruction of saturated charge clusters within the CMS tracker, a useful algorithm within the analysis.
The latest results dealing with data from 2017 and 2018 have recently been published and do not show any significant excess of events above the background expectation, but they do establish upper cross-section limits for these hypothetical particles produced.
I will present the continuation of this work by looking at possible extensions of research like the focus on missing transverse energy (MET).

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