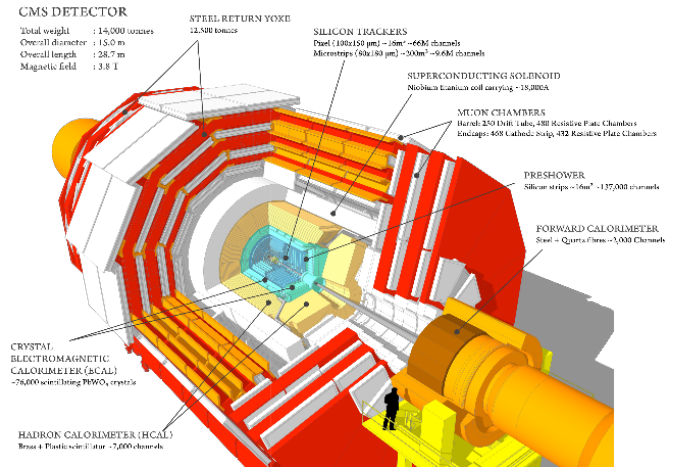




B EXAM

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Thesis Defense
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Search for long-lived particles with CMS at the LHC

Results are reported from a search for long-lived exotic particles in proton-proton collision events at a center-of-mass energy of $\sqrt{s}=13$ TeV delivered by the CERN LHC and collected by the CMS experiment. The data sample, which was recorded during 2015 and 2016, corresponds to an integrated luminosity of 38.5 fb^{-1} . This search uses benchmark signal models in which long-lived exotic particles are pair produced and each decays into two or more quarks, leading to a signal with multiple jets and two displaced vertices composed of many tracks. No events with two well-separated high-track-multiplicity vertices are observed. Upper limits are placed on the pair production cross section as a function of mass and lifetime of the long-lived particle. For masses between 800 and 2600 GeV and mean proper decay lengths between 1 and 40 mm, the analysis excludes cross sections above 0.3 fb at 95% confidence level. In models of R -parity violating supersymmetry in which the long-lived particles are gluinos decaying into multijet final states or top squarks decaying into dijet final states, gluino and top squark masses are excluded below 2200 GeV and 1400 GeV, respectively, for mean proper decay lengths between 0.6 and 80 mm. The results are also applicable to other models in which pair-produced long-lived particles decay into final states with multiple tracks.

Friday, July 20, 2018

1:00pm

401 Physical Sciences Bldg.