

# Searches for beyond the standard model physics with razor variables in pp collisions at $\sqrt{s} = 8$ TeV using CMS

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In this seminar I will present two searches for beyond the standard model physics with razor kinematic variables in proton-proton collisions at  $\sqrt{s} = 8$  TeV using the Compact Muon Solenoid (CMS) detector.

The first, is a search for dark matter in multijet events. If the dark matter observed to hold the structures of the universe together has particle nature, it couples super-weakly to the standard model particles and it would be pair-produced in association with energetic particles (jets, photons, bosons, etc). The razor variables  $M_R$  and  $R^2$  use the jets and the missing transverse energy in the event to discriminate between signal and background. The results are interpreted using an effective field theory approach and exclusion limits at 90% confidence level on dark matter production are derived for different assumptions on the production mechanism.

The second search looks for beyond the standard model physics in events that contain a Higgs boson in the decay chain of supersymmetric particles. Higgs bosons are reconstructed in diphoton final states in association with at least one jet. The razor variables are used to further discriminate between signal and background. The results are interpreted as constraints on a set of simplified SUSY benchmark models.