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Search for Dark Matter Produced in Association with a Resonant Bottom-Quark Pair

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A search for dark matter (DM) produced in association with a resonant $b\bar{b}$ pair is performed in proton-proton collisions at a center-of-mass energy of 13 TeV collected with the CMS detector during the Run 2 of the Large Hadron Colllider. The analyzed data sample corresponds to an integrated luminosity of 137 fb^{-1}.

Results are interpreted in terms of a novel theoretical model of DM production at the LHC the predicts the presence of a Higgs-boson-like particle in the dark sector, motivated simultaneously by the need to generate the masses of the particles in the dark sector and the possibility to relax constraints from the DM relic abundance by opening up a new annihilation channel. If such a dark Higgs boson decays into standard model (SM) states via a small mixing with the SM Higgs boson, one obtains characteristic large-radius jets in association with missing transverse momentum that can be used to efficiently discriminate signal from backgrounds. Limits on the signal strength of different dark Higgs boson mass hypotheses below 160 GeV are set for the first time with CMS data.

Mini Symposia (Invited Talks Only)

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