

Search for Dark Matter and Large Extra Dimensions in Monojet Events in pp Collisions at $\sqrt{s}=7$ TeV

A search for dark matter particles and large extra dimensions in events with an energetic jet and an imbalance in transverse momentum is performed in a sample of pp collision data corresponding to an integrated luminosity of 5.0 fb⁻¹ collected at a center-of-mass energy of 7 TeV with the CMS detector at the LHC. The data are in good agreement with the expected contributions from standard model processes. Constraints on the dark matter-nucleon scattering cross sections are determined in models relevant to spin-independent and spin-dependent interactions. For the spin independent model, these are the most constraining limits for a dark matter particle with mass below 3.5 GeV/c², a region unexplored by direct detection experiments. For the spin-dependent model, these are the most stringent constraints over the 1–400 GeV/c² mass range. The constraints on the Arkani-Hamed, Dimopoulos, and Dvali model parameters MD determined as a function of the number of extra dimensions are also an improvement over the previous results.

Primary author: VERGILI, Mehmet (Cukurova University)

Presenter: VERGILI, Mehmet (Cukurova University)