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General U(1) extension of the Standard Model

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We investigate a model with a gauge boson of the baryonic U(1)_B group.

Relevance: Problems of dark matter and baryon asymmetry of the Universe

Objectives: -Construction of the Lagrangian for baryon-photon interactions with hadrons at energy scales typical of current detectors. -Calculation of the baryon-photon production cross section in the main channels. -Estimation of the parameters of visible decays. -Estimation of the sensitivity of current detectors.

Methods: -We derive the mixing form factors of the baryon-photon with vector mesons from the chiral sigma model. -Low-energy theory (TiMoFey detector): within chiral theory, we take into account resonances that contribute at the characteristic energy scale. We calculate the baryon-photon production cross section in the main channels (πN and NN collisions). -High-energy theory: to calculate the production cross section in pp collisions at a higher energy scale, we use the tensor pomeron exchange notation.

Results: -We determine the sensitivity of the TiMoFey detector. -Also we consider general vector and axial vector particle (corresponding to arbitrary U(1) group, but not only baryon). We obtained decay channels and nucleon vertexes for such models.

Plans: -The sensitivity of high-energy detectors will be determined in the near future with the approach of the interference exchange.

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