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A dark force for hadrons

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We suggest the existence of a fundamental connection between baryonic and dark matter. This is motivated by both the stability of these two types of matter as well as the observed similarity of their present-day densities. A unified genesis of baryonic and dark matter arises naturally in models in which the baryon number is promoted to a spontaneously broken local gauge symmetry while the lepton number is explicitly violated. This is illustrated in a specific class of SUSY models using the Affleck-Dine mechanism. The dark matter candidate in these scenarios is charged under the baryon gauge symmetry and is required to have a mass at the GeV scale. We discuss the collider constraints from B-factories, the LEP and Tevatron experiments, as well as direct detection bounds. A baryonic dark force is shown to be consistent for all data for mediators as light as the GeV scale.

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