

Dark gauge mediated supersymmetry breaking by a massless dark photon

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The kinetic mixing can transfer the supersymmetry breaking from the hidden sector to the visible sector. We study dark gauge mediation supersymmetry breaking (dark GMSB) with large kinetic mixing. The massless dark photon allows such a large kinetic mixing, so the effect of the dark GMSB can become significant in the soft mass terms. For the neutralino sector, the dominant components in the dark photino-bino mixture state change along the size of the kinetic mixing. In the scalar sector, the mass spectrum is more sensitive to the kinetic mixing if the scalar particle has a large hypercharge. Such a distinguishable characteristic of the dark GMSB has a possibility to alter the phenomenology.

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