



Principles for a Unified Picture of Fermions

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It is shown that a chiral SU(2) model can break Lorentz symmetry spontaneously at the Lagrangian level when gauge bosons become massive. This model seems to propose the principles and the conceptual foundations leading to a unified picture of fermions, and may reduce the standard theory in a far simpler form. The model suggests to describe leptons and quarks as quasi excitations, while electromagnetic and strong interactions as secondary interactions mediated by Nambu-Goldstone bosons originated from spontaneous violations of global SU(2) and rotational symmetries. The possibility to observe Lorentz violating phenomena and their magnitudes are discussed. The model also provides an alternative scenario for baryon and lepton asymmetries of the Universe.

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