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A phase of confined electroweak force in the early Universe

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We consider a modified cosmological history in which the new physics causes the electroweak gauge sector, $SU(2)_L$, to confine before it is Higgsed and before the strong force confines. Eventually, the universe leaves this confining $SU(2)_L$ phase and returns to the phases we know to be present from BBN. In the confining $SU(2)_L$ phase, we argue that the quark and lepton electroweak-doublets form scalar condensates that acquire nonzero expectation values, thereby breaking global symmetries including baryon number and lepton number. The "weak" gauged forces $SU(3)_C \times U(1)_Y$ are broken to an $SU(2) \times U(1)$ subgroup. We discuss the symmetry breaking pattern, spectrum of mesons and composite fermions, and possible implications for early Universe cosmology.

Preferred Session

Cosmology

Comments

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