XXIV QUARK MATTER DARMSTADT 2014

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Quark Ensembles with Infinite Correlation Length

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Exactly integrable (in the Luttinger's sense) quark models of quantum field theory with infinite correlation length are considered. We calculate the form of energy distribution and find out such a form results in an instability of standard vacuum quark ensemble—Dirac sea. Then the corresponding momentum distribution becomes infinitely narrow with momentum cutoff going to infinity and leads to large (unlimited) fluctuations. The comparative analysis of various vacuum ensembles - the Dirac sea, neutral ensemble and the BCS superconductor state is made. We make a clear choice in favor of the BCS state as the ground state of quark ensemble with color interaction.

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