Abstract Submitted
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Vlasov Equation for Quantized Meson Fields MAMORU MATSUO[1], TETSUO MATSUI[2], Inst. Physics, Univ. Tokyo — In order to describe the final stage of space-time evolution of dense matter created by ultrarelativistic nuclear collisions, we formulate a kinetic theory of mesons starting from the Heisenberg equation of motion of self-interacting quantized fields. As a dense hadronic matter formed by ultrarelativistic nuclear collision is diluted by the expansion, one expects that the system undergoes a phase transition associated with the spontaneous breakdown of the chiral symmetry which is restored temporally after the collision by the formation of a quark-gluon plasma. As the quark-gluon plasma hadronizes and turns into the confining phase, the system would expand under the influence of the growing chiral condensate. This physical situation is very similar to what happens when some of the magnetically trapped atoms condense into the lowest single particle level forming a Bose-Einstein condensate. The dynamics of such a system is described by the coupled equations of motion in the form of the Boltzmann-Vlasov equations. We will show that a similar set of equations can be derived for a system of interacting mesons described by the relativistic quantum field theory and discuss on the dispersion relations of the collective mesonic excitations at finite temperatures using these kinetic equations.

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