

THE EFFECT OF HIGHER-ORDER MESONIC
INTERACTIONS ON THE CHIRAL PHASE
TRANSITION AND THE CRITICAL
TEMPERATURE

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S u m m a r y

In the present work, higher-order mesonic interactions are included in the linear sigma model at a finite temperature. The effective potential is minimized in the calculations of the sigma and pion effective masses. The field equations have been solved in the mean-field approximation, by using the extended iteration method at a finite temperature. The order of chiral phase transition, the effective sigma and pion masses, and the effective mesonic potential are investigated as functions of the temperature. We find that the chiral phase transition satisfies the Goldstone theorem below the critical temperature point, when the minimization condition is satisfied in the chiral limit. The value of the critical temperature is reduced as compared with that of the original model in agreement with lattice QCD results. The modified model is compared to with models in other works.