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Chiral phase transition and critical endpoint in the vectormeson extended linear sigma model

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We investigate the effects of (axial)vector mesons on the chiral phase transition in the framework of an $SU(3)$, (axial)vector meson extended linear sigma model with additional constituent quarks and Polyakov loops. We determine the parameters of the Lagrangian at zero temperature in a hybrid approach, where we treat the mesons at tree-level, while the constituent quarks at 1-loop level. We assume two nonzero scalar condensates and determine their temperature and baryochemical potential dependence according to the hybrid 1-loop level equations of states. We determine whether there is a critical endpoint of the phase boundary in the baryochemical potential - temperature plane. We also investigate the changes of the tree-level scalar/vector meson masses in the hot and dense medium.

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