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Chiral phase transition with the functional renormalization group equation KAZUHIKO KAMIKADO, KENJI FUKUSHIMA, Yukawa Institute for Theoretical Physics, Kyoto University — It has been conjectured by the perturbative renormalization group technique (epsilon-expansion) that, if interaction induced by the axial anomaly is suppressed at high temperature, the chiral phase transition of two-flavor quark matter is of fluctuation-induced first order transition. We discuss the shape of the effective potential using the linear sigma model and the functional renormalization group method and confirm that the shape change leads to the first-order phase transition. That is, the effective potential has a double-well structure in a certain parameter region. We also clarify the relation between the perturbative renormalization group (epsilon-expansion) and the functional renormalization group equations.

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