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The effects of thermal fluctuations of gauge fields in realistic dense quark matter TAEKO MATSUURA, University of Tokyo, KEI IIDA, RIKEN BNL Research Center, MOTOI TACHIBANA, Saga University, TETSUO HATSUDA, University of Tokyo — We investigate a high density phase structure of color superconducting quark matter near the boundary with a normal phase using the Ginzburg-Landau free energy. For realistic description, in addition to the effects of nonzero strange quark mass and electric charge neutrality, we take into account the effect of thermal fluctuations of gluons. We show how the gluon fluctuations change the high density phase structure near the boundary from the three successive second-order phase transitions, a modified color-flavor locked phase (ud, ds, and us pairings) → a “dSC” phase (ud and ds pairings) → an isoscalar pairing phase (ud pairing) → a normal phase (no pairing), obtained from mean-field calculations.

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