Masses of vector bosons in two-color dense QCD based on the hidden local symmetry TETSURO YAMAOKA, MASAYASU HARADA, CHIHO NONAKA, Nagoya University — In two-color QCD the chiral $SU(2N_f)$ symmetry is spontaneously broken to the $Sp(2N_f)$ symmetry. The Nambu-Goldstone bosons (NG bosons) carrying the baryon charge also appear together with the mesonic NG bosons in the low energy effective theory. It is known that the condensation of baryonic NG bosons cause the spontaneous breaking of $U(1)_B$ symmetry at a certain finite baryon density. Based on the hidden local symmetry (HLS), we construct the chiral effective Lagrangian for two-color QCD with two-flavor quarks at finite baryon density. The effective Lagrangian includes the NG bosons and the vector bosons expressing the ordinary mesons with $J^P = 1^-$ and the (anti-) baryons with $J^P = 1^+$. We study the vacuum structure of this system and show the chemical potential dependence of the masses of (anti-) baryonic vector bosons. We show that the masses of (anti-) baryonic vector bosons change their behavior at the critical chemical potential for the $U(1)_B$ symmetry breaking.

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