Correlations of chiral condensates and quark number with static quark sources

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We investigate correlation functions of the Polyakov loop and static meson/diquark systems with the chiral condensate and the quark number density at finite temperature. In particular the latter observable can give insight in the mechanism of screening and string breaking at finite temperature. We use for our analysis gauge field configurations generated in 2+1 flavor QCD with an improved staggered fermion action with almost physical light quark masses and a physical value of the strange quark mass on lattices with temporal extent $N_t=4$ and 6.