

XVth Quark Confinement and the Hadron Spectrum



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Dark pion DM: WIMP vs. SIMP

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I will assume the dark sector is described by QCD-like confining gauge theories, with dark pions and dark baryons that can make cold dark matter (CDM) of the Universe. If dark pion masses are in electroweak (EW) scale and they interact the SM sector through singlet scalar exchanges, they become weakly-interacting-massive-particle (WIMP) DM. If the dark pion mass becomes sub-GeV and the Wess-Zumino-Witten interaction is included, they make strongly-interacting-massive-particle (SIMP) DM. However the original SIMP scenario has a serious flaw, since the parameter space for the correct relic density and large DM self-scattering cross-section violates perturbativity of chiral perturbation theory. I point out that this problem can be cured by including the light dark vector mesons such as dark rho and dark omega meson.

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