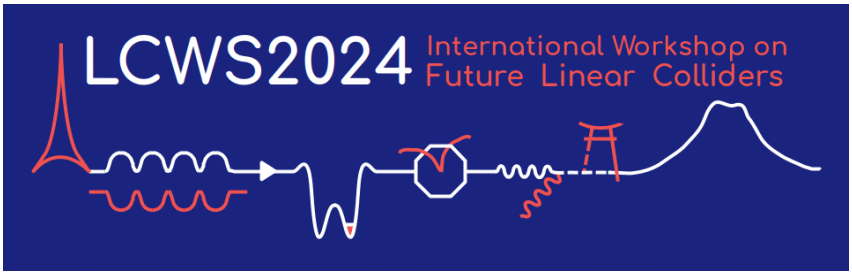

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Possible effects of the composite dark matter at the linear collider

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The existence of dark matter is currently one of the strong motivations for beyond the standard model. We consider the model of the composite dark matter. Our model assumes that meson-like dark matter (call it dark mesons) is a bounded state of dark quark (ψ) and anti-dark quark ($\bar{\psi}$) pairs, where ψ and $\bar{\psi}$ have a confining force at work. Confining force is based on the QCD-like $SU(N)$ hidden color gauge theory. This dark matter sector connects to the Standard model via a real singlet scalar particle. The $SU(N)$ hidden color gauge sector in the dynamical chiral symmetry breaking generates Nambu-Goldstone bosons ($\tilde{\pi}$ dark meson) and massive composite scalar bosons ($\tilde{\sigma}$ dark meson) simultaneously. A real singlet scalar particle gives the current mass for the dark quark. The current mass for dark quark breaks explicitly chiral symmetry. Nambu-Goldstone bosons are massive, meaning they are dark matter candidates. We use an effective theory for dark matter interactions in the framework of the linear sigma model. In the dark mesons of $SU(N)$ hidden color, the chiral partner of the $\tilde{\pi}$ meson is the $\tilde{\sigma}$ meson (iso scalar-scalar). $\tilde{\sigma}$ is also a candidate as dark matter. We will investigate the missing energy for the final state of our model at HL-LHC and the future linear collider.

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