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The mixing effects of scalar mesons in a Skyrme model

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We study the effects of light scalar mesons on the Skyrmion properties by first constructing a mesonic model including pion, rho and omega mesons as well as a two-quark and a four-quark scalar states. In our model, the physical scalar mesons are defined as mixing states of the two- and four-quark states. We find that the scalar mesons reduce the Skyrmion mass as expected and the lighter scalar meson is, the smaller soliton mass and larger soliton size become.

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