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Dense matter in a constituent quark model

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In this work, we investigate the color-spin interaction of a quark, a diquark and a baryon with their surrounding baryons and/or quark matter. This is accomplished by classifying all possible flavor and spin states of the resulting multi-quark configuration in both the flavor $SU(2)$ and $SU(3)$ symmetric cases. We also discuss the three-body confinement potential and show that this does not contribute to the outcome. Furthermore, we find that a quark becomes more stable than a baryon when the number of surrounding baryons is three or more. Finally, when we consider the internal color-spin factor of a probe, our results show that the effects of the color-spin interaction of a multi-quark configuration is consistent with the so-called diquarkionic configuration.

Category

Theory

Collaboration (if applicable)

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